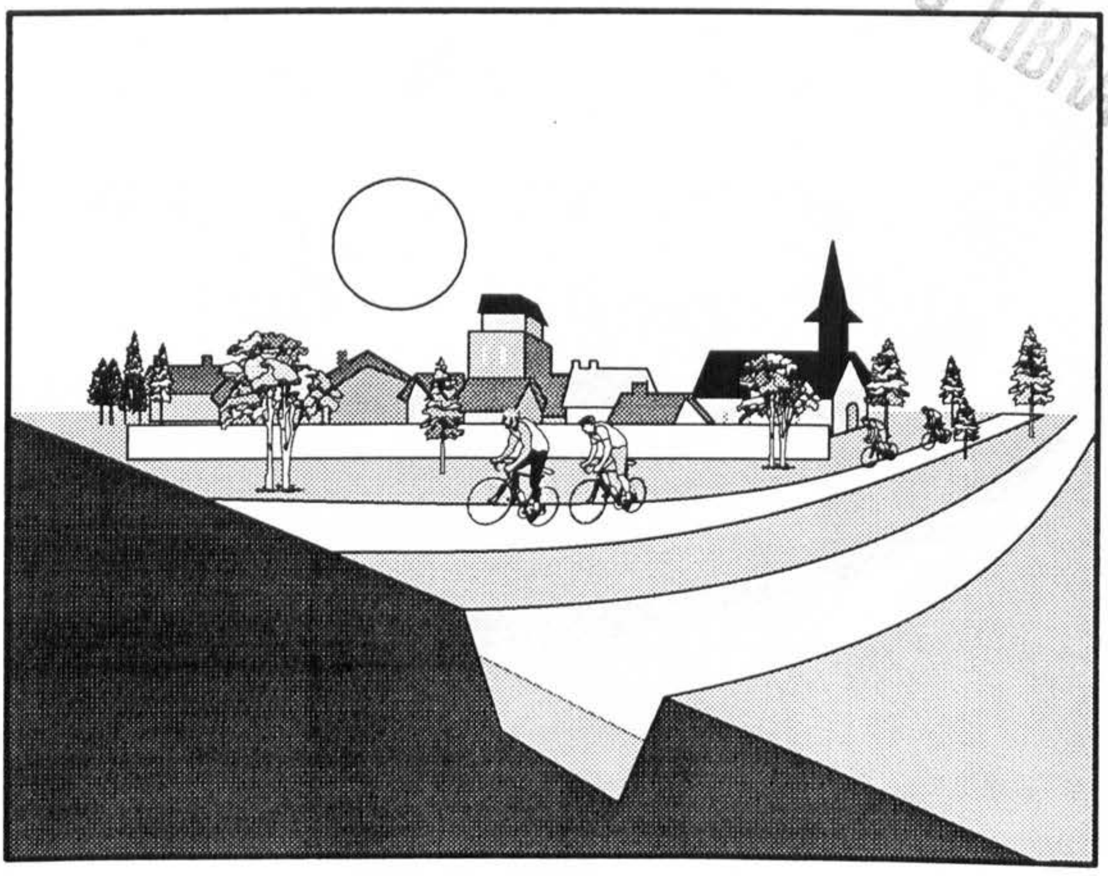
US Army Corps
of Engineers
New Orleans District

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
DOTD

Amite River and Tributaries, Louisiana

East Baton Rouge Parish Watershed Flood Control Projects



Feasibility Study

Volume 4 of 4
Appendices H,I, J,and K
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479 pages

APPENDIX H

ECONOMICS

EAST BATON ROUGE PARISH
APPENDIX H
ECONOMIC ANALYSIS

INTRODUCTION.

General. This appendix presents an economic evaluation of the urban flood control improvements being considered in East Baton Rouge Parish, Louisiana. It was prepared in accordance with Engineering Regulation (ER) 1105-2-100, Planning Guidance. The National Economic Development Procedures Manual for Urban Flood Damage prepared by the Water Resources Support Center, Institute for Water Resources was also used as a reference.

The evaluation consists of a description of the methodology used to determine economic damages and benefits under existing conditions, project costs, and benefit-to-cost analysis. The evaluation uses 1994 price levels. The proposed improvements (see Plan Formulation) were evaluated by comparing estimated average annual benefits that would accrue to the study area with estimated average annual project costs. Benefits were converted to average annual values by use of a Federal discount rate of 8 percent and a project life of 50 years. The estimated project base year differs for each area and type of project analyzed.

National Economic Development Benefits Considered. The National Economic Development Procedures Manual for Urban Flood Damage recognizes four primary categories of benefits for urban flood control plans: inundation reduction, intensification, location, and employment benefits. Inundation reduction is the only primary category of NED benefits considered.

Inundation Reduction Benefits. Most benefits from a flood protection project result from the reduction of actual or potential damages due to inundation. Physical inundation reduction damages include damages to residential and commercial structures, losses to the contents in those structures, and damages to privately-owned automobiles. Only inundation reduction benefits on existing development were considered for project justification.

Emergency Cost Reduction Benefits. Emergency costs are those costs incurred by the community during and immediately following a major storm. They include emergency measures such as sandbagging and police overtime, damages to roads and bridges, and the subsequent clean-up of private and public properties. Some of these damages and costs will be reduced due to the flood protection provided by the project. The reduction of these costs will be considered a benefit attributable to the project.

Erosion Control Benefits. Certain watersheds in East Baton Rouge Parish experience severe erosion problems. Stabilizing these banks by the concrete lining of the channels will provide substantial economic benefits.

Other Benefits. When a protection project is completed, certain indirect benefits often result, and they contribute to the NED account. Benefits in this category which were considered a potential reduction in Flood Insurance Administration (FIA) costs, a reduction in the amount of fill material needed under the slabs of houses to be built in future years and recreation benefits.

The net national cost of the flood insurance program is the cost of administering the program. Potential benefits would arise from a reduction in this administrative overhead, which consists of agent commissions, the costs of servicing, and claims adjustment. The current administrative cost per policy is $111.

Fill reduction benefits will accrue to future home owners to the extent that the project lowers the elevation of the 100-year flood event, since for every one foot decrease in the 100-year event, one foot less of fill material is required.

Benefits resulting from improving recreational areas and facilities are discussed in detail in the environmental appendix (E) under Recreation Analysis.

BENEFIT COMPUTATION - INUNDATION REDUCTION

SURVEY OF STRUCTURES. In April of 1987 Gulf South Research Corporation (GSRC) of Baton Rouge was contracted to produce an inventory of structures within the 500-year flood plain of the Amite River Basin. Type, value, and first floor elevation were noted for each structure. In addition, ground elevation, type of foundation, number of stories, first floor square footage, type of construction, and the condition of the structure were recorded. This inventory was completed 1 July. In 1992, additional surveys were made of the upper Bayou Fountain reaches. Attempts were made to check the need for updates due to new development in all areas, and new development since 1987 was determined to be insignificant.

RESIDENTIAL STRUCTURES. This category was subdivided into single-story, two-story, and mobile homes. Values of these structures were determined using current real estate transfers, or current prices, or homes for sale minus lot prices. Computerized Real Estate Transfers (COMPTRAN) for the year 1985 was utilized in determining these values.

Ground elevations were determined using aerial photographs containing 2-foot contour lines. First floor elevations were determined by adding between 1.0 and 4.0 feet to ground elevations based upon visual observation.

In areas where housing types varied considerably, as in rural areas, information was obtained by surveying structure by structure. In urban areas, such as in homogeneous subdivisions, house value, number of stories, and floor elevations were generated from sampling.

NONRESIDENTIAL STRUCTURES. These structures were surveyed by small subareas for their pertinent characteristics such as type of business, number of stories, type of foundation, construction, physical condition, and dimensions. After all the field work was accomplished, the businesses were classified and placed into one of the following fifteen categories:

NON-RESIDENTIAL CATEGORIES

1. Business Services
2. Public Gathering Places, Communications, Transportation, Utilities
3. Cleaning, Maintenance, Grooming
4. Contractor Operations
5. Department Stores
6. Eating and Drinking Establishments
7. Gas Service Stations
8. Grocery Stores
9. Food Stores (Specialty)
10. Home and Auto Supplies, Appliances
11. Medical Buildings
12. Proprietary (Drug) Stores
13. Repair Services
14. Ready-to-Wear
15. Miscellaneous

Each commercial structure was then assigned a value per square foot based on data obtained through the Marshall and Swift Valuation Service. Buildings were classified by construction types in order to determine the base cost per square foot. This base cost was then adjusted for factors such as heating and cooling, local construction cost, current cost conditions, age, and life expectancy of the building. The price per square foot was multiplied by the square footage size of the building to determine a total value for each commercial structure. An average ground elevation was established based on structure location as pinpointed on the contour maps. First floor elevations were determined based on visual observations for each individual nonresidential structure.

DELINEATION OF STUDY AREA. East Baton Rouge Parish contains 40 sub-basins. Plans studied in this analysis provide reduced damages in 13 of these sub-basins in 5 watersheds. Each sub-basin was broken into reaches based upon the hydrologic make-up of that particular sub-basin. Each hydrologic reach was further subdivided into segments called mini-reaches. Each mini-reach represents approximately a 1-foot change in the elevation of the 100-year flood level at the center of the mini-reach. Plate 2 delineates each sub-basin while Tables 1A and 1B provide the total number of structures by floodplain, per damage category, within each subbasin, with and without project. The total value of structures in each basin is located in Tables 21A & 21B.

TABLE 1A
NUMBER OF STRUCTURES IN THE VARIOUS
FLOODPLAINS OF EAST BATON ROUGE
WITH AND WITHOUT PROJECT

NOTE: FLOOD ZONES THE SAME FOR ALL EXCEPT BAYOU FOUNTAIN

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 500 YEAR	ALL FLOOD ZONES
	BLACKWATER BAYOU WATERSHED							
	BASIN NAME: BLACKWATER BAYOU							
	WITHOUT PROJECT							
13	1-STORY	198	72	332	182	62	110	956
	2-STORY	24	3	9	7	2	5	50
	MOBILE HOME	4	5	21	9	21	101	161
	COMMERCIAL	10	5	18	10	4	9	56
	TOTAL	236	85	380	208	89	225	1,223
	WITH PROJECT: BW-P2 NED PLAN							
	1-STORY	92	23	231	231	231	148	956
	2-STORY	12	1	15	7	9	6	50
	MOBILE HOME	1	0	15	14	16	115	161
	COMMERCIAL	1	1	20	8	13	13	56
	TOTAL	106	25	281	260	269	282	1,223

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 500 YEAR	ALL FLOOD ZONES
	BEAVER BAYOU WATERSHED							
	BASIN NAME: BEAVER BAYOU							
	WITHOUT PROJECT							
14	1-STORY	315	72	39	112	69	640	1,247
	2-STORY	14	2	1	4	4	28	53
	MOBILE HOME	9	19	8	9	12	195	252
	COMMERCIAL	95	8	2	7	2	133	247
	TOTAL	433	101	50	132	87	996	1,799
	WITH PROJECT: BBN-P2 NED PLAN							
	1-STORY	133	22	71	49	151	821	1,247
	2-STORY	7	0	2	2	3	39	53
	MOBILE HOME	5	2	2	2	8	233	252
	COMMERCIAL	18	2	3	7	6	211	247
	TOTAL	163	26	78	60	168	1,304	1,799

TABLE 1A continued

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 500 YEAR	ALL FLOOD ZONES
	WARD'S CREEK WATERSHED							
	BASIN NAME: WARD'S CREEK							
	WITHOUT PROJECT							
21	1-STORY	14	59	56	182	456	1,275	2,042
	2-STORY	1	0	5	2	3	25	36
	MOBILE HOME	0	0	0	0	1	0	1
	COMMERCIAL	3	13	17	48	91	220	392
	TOTAL	18	72	78	232	551	1,520	2,471
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	1	16	61	205	481	1,278	2,042
	2-STORY	1	0	2	5	3	25	36
	MOBILE HOME	0	0	0	0	1	0	1
	COMMERCIAL	2	5	18	34	116	217	392
	TOTAL	4	21	81	244	601	1,520	2,471
	BASIN NAME: BAYOU DUPLANTIER							
	WITHOUT PROJECT							
25	1-STORY	3	13	1	22	9	65	113
	2-STORY	2	6	6	6	6	15	41
	MOBILE HOME	0	0	0	0	0	0	0
	COMMERCIAL	12	2	2	4	13	13	46
	TOTAL	17	21	9	32	28	93	200
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	2	14	1	13	18	65	113
	2-STORY	1	6	7	2	10	15	41
	MOBILE HOME	0	0	0	0	0	0	0
	COMMERCIAL	12	2	2	2	14	14	46
	TOTAL	15	22	10	17	42	94	200
	BASIN NAME: DAWSON CREEK							
	WITHOUT PROJECT							
26	1-STORY	51	50	20	14	24	72	231
	2-STORY	10	5	3	1	1	9	29
	MOBILE HOME	0	0	0	0	0	0	0
	COMMERCIAL	52	50	11	17	15	64	209
	TOTAL	113	105	34	32	40	145	469
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	51	50	20	14	24	72	231
	2-STORY	10	5	3	1	1	9	29
	MOBILE HOME	0	0	0	0	0	0	0
	COMMERCIAL	52	50	11	17	15	64	209
	TOTAL	113	105	34	32	40	145	469

TABLE 1A continued

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 500 YEAR	ALL FLOOD ZONES
	WARD'S CREEK WATERSHED continued							
	BASIN NAME: NORTH BRANCH-WARD'S CREEK							
	WITHOUT PROJECT							
27	1-STORY	17	84	41	161	167	366	836
	2-STORY	3	18	1	21	61	45	149
	MOBILE HOME	0	0	0	0	0	0	0
	COMMERCIAL	23	16	14	9	19	233	314
	TOTAL	43	118	56	191	247	644	1,299
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	2	20	10	4	36	764	836
	2-STORY	1	10	1	10	9	118	149
	MOBILE HOME	0	0	0	0	0	0	0
	COMMERCIAL	18	6	14	3	11	262	314
	TOTAL	21	36	25	17	56	1,144	1,299
	BASIN NAME: DAWSON CREEK							
	WITHOUT PROJECT							
30	1-STORY	20	69	17	8	119	54	287
	2-STORY	0	2	2	10	18	19	51
	MOBILE HOME	0	0	0	0	0	0	0
	COMMERCIAL	19	20	3	5	12	82	141
	TOTAL	39	91	22	23	149	155	479
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	20	69	3	21	108	66	287
	2-STORY	0	2	0	9	20	20	51
	MOBILE HOME	0	0	0	0	0	0	0
	COMMERCIAL	17	22	2	5	13	82	141
	TOTAL	37	93	5	35	141	168	479
	BASIN NAME: WARD'S CREEK							
	WITHOUT PROJECT							
32	1-STORY	17	5	49	29	82	155	337
	2-STORY	3	2	3	2	2	15	27
	MOBILE HOME	4	0	0	0	1	71	76
	COMMERCIAL	25	4	19	15	2	13	78
	TOTAL	49	11	71	46	87	254	518
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	17	5	49	29	82	155	337
	2-STORY	3	2	3	2	2	15	27
	MOBILE HOME	4	0	0	0	1	71	76
	COMMERCIAL	25	4	19	15	2	13	78
	TOTAL	49	11	71	46	87	254	518

TABLE 1A continued

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 500 YEAR	ALL FLOOD ZONES
	JONES CREEK WATERSHED							
	BASIN NAME: JONES CREEK							
	WITHOUT PROJECT							
22	1-STORY	57	28	123	92	141	1,062	1,503
	2-STORY	7	6	24	16	36	212	301
	MOBILE HOME	1	1	2	0	1	4	9
	COMMERCIAL	50	29	51	30	35	185	380
	TOTAL	115	64	200	138	213	1,463	2,193
	WITH PROJECT: JCCL-P1 NED PLAN							
	1-STORY	2	1	3	1	54	1,442	1,503
	2-STORY	0	0	0	1	15	285	301
	MOBILE HOME	0	0	1	0	1	7	9
	COMMERCIAL	5	0	2	0	43	330	380
	TOTAL	7	1	6	2	113	2,064	2,193
	BASIN NAME: LIVELY BAYOU TRIBUTARY							
	WITHOUT PROJECT							
23	1-STORY	505	126	114	44	60	69	918
	2-STORY	20	10	4	3	5	13	55
	MOBILE HOME	0	0	0	0	0	0	0
	COMMERCIAL	2	1	0	0	0	0	3
	TOTAL	527	137	118	47	65	82	976
	WITH PROJECT: JCCL-P1 NED PLAN							
	1-STORY	0	0	0	7	172	739	918
	2-STORY	0	0	0	1	16	38	55
	MOBILE HOME	0	0	0	0	0	0	0
	COMMERCIAL	0	0	0	0	0	3	3
	TOTAL	0	0	0	8	188	780	976
	BASIN NAME: LIVELY BAYOU							
	WITHOUT PROJECT							
24	1-STORY	116	55	64	24	78	101	438
	2-STORY	10	58	5	0	8	18	99
	MOBILE HOME	0	0	1	0	11	25	37
	COMMERCIAL	31	10	19	2	9	3	74
	TOTAL	157	123	89	26	106	147	648
	WITH PROJECT: JCCL-P1 NED PLAN							
	1-STORY	0	0	17	2	102	317	438
	2-STORY	0	0	0	0	11	88	99
	MOBILE HOME	0	0	0	0	0	37	37
	COMMERCIAL	0	0	0	0	38	36	74
	TOTAL	0	0	17	2	151	478	648

TABLE 1A continued

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 500 YEAR	ALL FLOOD ZONES
	JONES CREEK WATERSHED continued							
	BASIN NAME: WEINER CREEK							
	WITHOUT PROJECT							
28	1-STORY	8	0	13	0	45	229	295
	2-STORY	0	0	0	2	4	36	42
	MOBILE HOME	0	0	0	0	0	1	1
	COMMERCIAL	0	0	1	0	0	21	22
	TOTAL	8	0	14	2	49	287	360
	WITH PROJECT: JCCL-P1 NED PLAN							
	1-STORY	0	0	0	0	0	295	295
	2-STORY	0	0	0	0	0	42	42
	MOBILE HOME	0	0	0	0	0	1	1
	COMMERCIAL	0	0	0	0	0	22	22
	TOTAL	0	0	0	0	0	360	360

BASIN NO.	STRUCTURE CATEGORY	0-5 YEAR	5-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 500 YEAR	ALL FLOOD ZONES
	BAYOU FOUNTAIN WATERSHED							
	BASIN NAME: BAYOU FOUNTAIN *							
	WITHOUT PROJECT							
29	1-STORY	41	130	26	33	531	432	1,193
	2-STORY	7	50	113	5	196	133	504
	MOBILE HOME	0	0	0	0	0	6	6
	APT. BLDGS.	39	125	101	10	54	39	368
	COMMERCIAL	8	22	11	45	112	82	280
	TOTAL	95	327	251	93	893	692	2,351
	WITH PROJECT: BF10B NED PLAN							
	1-STORY	25	41	34	127	491	475	1,193
	2-STORY	1	14	0	156	115	218	504
	MOBILE HOME	0	0	0	0	0	6	6
	APT. BLDGS.	37	127	76	33	56	39	368
	COMMERCIAL	7	18	14	43	99	99	280
	TOTAL	70	200	124	359	761	837	2,351

Note: The First Two Flood Zones Are Different For Basin 29. It Was Analyzed With Greater Precision In Order To Achieve More Accuracy In This Area. An Additional Damage Category Was Incorporated Into The Analysis.

TABLE 1B
NUMBER OF STRUCTURES IN THE VARIOUS
FLOODPLAINS OF EAST BATON ROUGE
WITH AND WITHOUT PROJECT
WITH 10-YEAR UNCONTROLLED COMITE RIVER DIVERSION IN PLACE
NOTE: FLOOD ZONES THE SAME FOR ALL EXCEPT BAYOU FOUNTAIN

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 50 YEAR	ALL FLOOD ZONES
	BLACKWATER BAYOU WATERSHED							
	BASIN NAME: BLACKWATER BAYOU							
	WITHOUT PROJECT							
13	1-STORY	172	27	296	209	137	115	956
	2-STORY	20	2	12	9	2	5	50
	MOBILE HOME	4	4	20	10	15	108	161
	COMMERCIAL	10	4	16	8	7	11	56
	TOTAL	206	37	344	236	161	239	1,223
	WITH PROJECT: BW-P2 NED PLAN							
	1-STORY	66	12	191	182	273	232	956
	2-STORY	8	0	17	10	8	7	50
	MOBILE HOME	1	0	13	11	12	124	161
	COMMERCIAL	1	1	15	10	10	19	56
	TOTAL	76	13	236	213	303	382	1,223

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 50 YEAR	ALL FLOOD ZONES
	BEAVER BAYOU WATERSHED							
	BASIN NAME: BEAVER BAYOU							
	WITHOUT PROJECT							
14	1-STORY	312	72	16	100	71	676	1,247
	2-STORY	14	2	1	1	7	28	53
	MOBILE HOME	9	17	6	9	14	197	252
	COMMERCIAL	94	7	2	4	5	135	247
	TOTAL	429	98	25	114	97	1,036	1,799
	WITH PROJECT: BBN-P2 NED PLAN							
	1-STORY	133	22	71	49	151	821	1,247
	2-STORY	7	0	2	2	3	39	53
	MOBILE HOME	5	2	2	2	8	233	252
	COMMERCIAL	18	2	3	7	6	211	247
	TOTAL	163	26	78	60	168	1,304	1,799

TABLE 1B continued

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 50 YEAR	ALL FLOOD ZONES
	WARD'S CREEK WATERSHED							
	BASIN NAME: WARD'S CREEK							
	WITHOUT PROJECT							
21	1-STORY	14	59	56	182	456	1,275	2,042
	2-STORY	1	0	5	2	3	25	36
	MOBILE HOME	0	0	0	0	1	0	1
	COMMERCIAL	3	13	17	48	91	220	392
	TOTAL	18	72	78	232	551	1,520	2,471
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	1	16	61	205	481	1,278	2,042
	2-STORY	1	0	2	5	3	25	36
	MOBILE HOME	0	0	0	0	1	0	1
	COMMERCIAL	2	5	18	34	116	217	392
	TOTAL	4	21	81	244	601	1,520	2,471
	BASIN NAME: BAYOU DUPLANTIER							
	WITHOUT PROJECT							
25	1-STORY	3	13	1	22	9	65	113
	2-STORY	2	6	6	6	6	15	41
	MOBILE HOME	0	0	0	0	0	0	0
	COMMERCIAL	12	2	2	4	13	13	46
	TOTAL	17	21	9	32	28	93	200
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	2	14	1	13	18	65	113
	2-STORY	1	6	7	2	10	15	41
	MOBILE HOME	0	0	0	0	0	0	0
	COMMERCIAL	12	2	2	2	14	14	46
	TOTAL	15	22	10	17	42	94	200
	BASIN NAME: DAWSON CREEK							
	WITHOUT PROJECT							
26	1-STORY	51	50	20	14	24	72	231
	2-STORY	10	5	3	1	1	9	29
	MOBILE HOME	0	0	0	0	0	0	0
	COMMERCIAL	52	50	11	17	15	64	209
	TOTAL	113	105	34	32	40	145	469
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	51	50	20	14	24	72	231
	2-STORY	10	5	3	1	1	9	29
	MOBILE HOME	0	0	0	0	0	0	0
	COMMERCIAL	52	50	11	17	15	64	209
	TOTAL	113	105	34	32	40	145	469

TABLE 1B continued

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 50 YEAR	ALL FLOOD ZONES
	WARD'S CREEK WATERSHED continued							
	BASIN NAME: NORTH BRANCH-WARD'S CREEK							
	WITHOUT PROJECT							
27	1-STORY	17	84	41	161	167	366	836
	2-STORY	3	18	1	21	61	45	149
	MOBILE HOME	0	0	0	0	0	0	0
	COMMERCIAL	23	16	14	9	19	233	314
	TOTAL	43	118	56	191	247	644	1,299
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	2	20	10	4	36	764	836
	2-STORY	1	10	1	10	9	118	149
	MOBILE HOME	0	0	0	0	0	0	0
	COMMERCIAL	18	6	14	3	11	262	314
	TOTAL	21	36	25	17	56	1,144	1,299
	BASIN NAME: DAWSON CREEK							
	WITHOUT PROJECT							
30	1-STORY	20	69	17	8	119	54	287
	2-STORY	0	2	2	10	18	19	51
	MOBILE HOME	0	0	0	0	0	0	0
	COMMERCIAL	19	20	3	5	12	82	141
	TOTAL	39	91	22	23	149	155	479
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	20	69	3	21	108	66	287
	2-STORY	0	2	0	9	20	20	51
	MOBILE HOME	0	0	0	0	0	0	0
	COMMERCIAL	17	22	2	5	13	82	141
	TOTAL	37	93	5	35	141	168	479
	BASIN NAME: WARD'S CREEK							
	WITHOUT PROJECT							
32	1-STORY	17	5	49	29	82	155	337
	2-STORY	3	2	3	2	2	15	27
	MOBILE HOME	4	0	0	0	1	71	76
	COMMERCIAL	23	6	19	15	2	13	78
	TOTAL	47	13	71	46	87	254	518
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	17	5	49	29	82	155	337
	2-STORY	3	2	3	2	2	15	27
	MOBILE HOME	4	0	0	0	1	71	76
	COMMERCIAL	23	6	19	3	14	13	78
	TOTAL	47	13	71	34	99	254	518

TABLE 1B continued

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 50 YEAR	ALL FLOOD ZONES
	JONES CREEK WATERSHED							
	BASIN NAME: JONES CREEK							
	WITHOUT PROJECT							
22	1-STORY	57	28	91	113	148	1,066	1,503
	2-STORY	7	6	19	15	38	216	301
	MOBILE HOME	1	1	0	2	0	5	9
	COMMERCIAL	50	29	51	28	36	186	380
	TOTAL	115	64	161	158	222	1,473	2,193
	WITH PROJECT: JCCL-P1 NED PLAN							
	1-STORY	1	1	1	1	21	1,478	1,503
	2-STORY	0	0	0	0	9	292	301
	MOBILE HOME	0	0	0	1	1	7	9
	COMMERCIAL	5	0	2	0	22	351	380
	TOTAL	6	1	3	2	53	2,128	2,193
	BASIN NAME: LIVELY BAYOU TRIBUTARY							
	WITHOUT PROJECT							
23	1-STORY	505	126	114	44	60	69	918
	2-STORY	20	10	4	3	5	13	55
	MOBILE HOME	0	0	0	0	0	0	0
	COMMERCIAL	2	1	0	0	0	0	3
	TOTAL	527	137	118	47	65	82	976
	WITH PROJECT: JCCL-P1 NED PLAN							
	1-STORY	0	0	0	7	172	739	918
	2-STORY	0	0	0	1	16	38	55
	MOBILE HOME	0	0	0	0	0	0	0
	COMMERCIAL	0	0	0	0	0	3	3
	TOTAL	0	0	0	8	188	780	976
	BASIN NAME: LIVELY BAYOU							
	WITHOUT PROJECT							
24	1-STORY	116	55	64	24	78	101	438
	2-STORY	10	58	5	0	8	18	99
	MOBILE HOME	0	0	1	0	11	25	37
	COMMERCIAL	31	10	19	2	9	3	74
	TOTAL	157	123	89	26	106	147	648
	WITH PROJECT: JCCL-P1 NED PLAN							
	1-STORY	0	0	17	2	102	317	438
	2-STORY	0	0	0	0	11	88	99
	MOBILE HOME	0	0	0	0	0	37	37
	COMMERCIAL	0	0	0	0	38	36	74
	TOTAL	0	0	17	2	151	478	648

TABLE 1B continued

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 50 YEAR	ALL FLOOD ZONES
	JONES CREEK WATERSHED continued							
	BASIN NAME: WEINER CREEK							
	WITHOUT PROJECT							
28	1-STORY	8	0	13	0	45	229	295
	2-STORY	0	0	0	2	4	36	42
	MOBILE HOME	0	0	0	0	0	1	1
	COMMERCIAL	0	0	1	0	0	21	22
	TOTAL	8	0	14	2	49	287	360
	WITH PROJECT: JCCL-P1 NED PLAN							
	1-STORY	0	0	0	0	0	295	295
	2-STORY	0	0	0	0	0	42	42
	MOBILE HOME	0	0	0	0	0	1	1
	COMMERCIAL	0	0	0	0	0	22	22
	TOTAL	0	0	0	0	0	360	360

BASIN NO.	STRUCTURE CATEGORY	0-5 YEAR	5-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 50 YEAR	ALL FLOOD ZONES
	BAYOU FOUNTAIN WATERSHED							
	BASIN NAME: BAYOU FOUNTAIN *							
	WITHOUT PROJECT							
29	1-STORY	41	121	34	34	531	432	1,193
	2-STORY	7	50	112	6	196	133	504
	MOBILE HOME	0	0	0	0	0	6	6
	APT. BLDGS.	39	125	101	10	54	39	368
	COMMERCIAL	8	21	12	45	112	82	280
	TOTAL	95	317	259	95	893	692	2,351
	WITH PROJECT: BF10B NED PLAN							
	1-STORY	25	40	26	136	490	476	1,193
	2-STORY	1	14	0	156	115	218	504
	MOBILE HOME	0	0	0	0	0	6	6
	APT. BLDGS.	37	127	76	33	56	39	368
	COMMERCIAL	7	18	11	46	99	99	280
	TOTAL	70	199	113	371	760	838	2,351

Note: The First Two Flood Zones Are Different For Basin 29.
It Was Analyzed With Greater Precision In Order To
Achieve More Accuracy In This Area. An Additional
Damage Category Was Incorporated Into The Analysis.

DEPTH-DAMAGE RELATIONSHIPS FOR STRUCTURES AND CONTENTS. Depth-damage relationships are estimates of damages that would occur at varying depths of flooding. The relationships for the study area were compiled by 1/2-foot increments of flooding to a depth of 15 feet over the ground flood elevation. Damages are expressed as a percent of depreciated pre-flood structure and contents values.

Residential. Under contract DACW38-79-C-0023 conducted in 1979-1980 for the Lake Pontchartrain Hurricane Protection Project (LPHPP) study, depth damage relationships were developed which showed the relationship among contents values, structure values, and damages that would be sustained in both categories with various depths of flooding. Structure values were aggregated into three types: single-story, two-story, and mobile home. Table 2 presents depth-damages relationships for freshwater damage, the type which would occur by overflow within East Baton Rouge Parish. Due to the close proximity of the two areas, and the similar climates, construction types and values, and socio-economic characteristics, use of this data was deemed to be appropriate.

East Baton Rouge Parish is located 75 miles northwest of New Orleans, with a non-stop driving time of approximately 1 hour. The geographic location of the study area lies within the central region of the Marshall and Swift Construction Costs Climate map. East Baton Rouge Parish and the area surveyed as part of the Lake Pontchartrain study are classified as having a mild climate. In general, houses in this climate have 2" x 4" stud construction, minimal wall and ceiling insulation, and single window glazing. Also, due to the mild climate and the high water table in the region, the structures have a foundation depth of only 18 inches, and do not have basements.

While the number of households in East Baton Rouge, which totaled 139,800 in 1992, was less than a quarter of the number in Jefferson and Orleans Parishes, which totaled 457,000 and 167,000, respectively, the types of housing construction and values are very similar in the two areas. According to the Marshall and Swift Residential Estimator

Table 2
FRESHWATER DEPTH-DAMAGE RELATIONSHIPS
For Residential Structures

Depth of Flooding (Ft.)	PERCENT DAMAGE TO STRUCTURE One Story (%)	Two Story (%)	Mobile Home (%)
-1.0	0.0	0.0	0.0
-0.5	0.0	0.5	2.0
0.0	9.0	7.5	30.0
0.5	18.7	12.3	63.5
1.0	26.0	15.7	76.8
1.5	32.3	18.3	87.0
2.0	36.7	20.7	92.0
2.5	40.4	22.8	95.6
3.0	43.0	24.4	97.8
3.5	45.6	25.8	99.0
4.0	48.0	26.8	99.8
4.5	49.8	27.9	100.0
5.0	51.4	28.6	100.0
5.5	53.0	29.2	100.0
6.0	54.2	29.9	100.0
6.5	55.3	30.0	100.0
7.0	56.0	30.0	100.0
7.5	57.0	30.0	100.0
8.0	57.8	30.7	100.0
8.5	58.4	33.2	100.0
9.0	59.0	37.0	100.0
9.5	59.5	40.0	100.0
10.0	59.9	42.3	100.0
10.5	60.0	44.3	100.0
11.0	60.0	46.1	100.0
11.5	60.0	47.5	100.0
12.0	60.0	48.2	100.0
12.5	60.0	49.3	100.0
13.0	60.0	49.9	100.0
13.5	60.0	50.1	100.0
14.0	60.0	50.3	100.0
14.5	60.0	50.4	100.0
15.0	60.0	50.5	100.0

Source: DACW38-79-C-0023 Output, October 1980, US Army Engineer District, New Orleans, contract with CH2MHill.

Service, the local multiplier for East Baton Rouge Parish, which adjusts the costs of construction for a specific geographical location, is only 1% lower than the multiplier for Jefferson and Orleans Parishes. Each of the multipliers is below the national average.

Construction types range from older neighborhood pier homes, with hardwood floors, high ceilings and screened porches, to newer brick slab homes located primarily in the suburban areas.

According to the 1990 Census data, the median value of the occupied housing units in East Baton Rouge Parish was $69,100, while in Jefferson and Orleans Parishes, housing units averaged $71,400 and $69,200, respectively. Each of these median values was below the national average of $79,100.

As of the third quarter of 1992, Baton Rouge and New Orleans had a cost of housing index of 85.9 and 84.8, respectively, compared to the national average of 100.0. Similarly, the cost of living composite index of 99.0 for Baton Rouge and 96.8 for New Orleans were below the national average of 100.0. The all-items index includes the prices for groceries, housing, utilities, transportation, and health care.

The retail and automobile sales per household in the three parishes for 1992 also showed similar patterns. While the effective buying income of the Baton Rouge area was less than 25% of that of the New Orleans area, the average sales per household were approximately the same for the two areas. In the Baton Rouge area, the average spending on retail and automobiles per household was $17,042, as compared to $17,428 for the New Orleans area.

Per capita income as of the 1990 Census, in East Baton Rouge Parish was $13,126, as compared to $12,845 in Jefferson and $11,372 in Orleans. Each of these is well below the national average of $18,660.

For the LPHPP analysis, detailed room-by-room inventories of 125 sample residential structures were conducted. The contents were valued using standardized prices obtained from

catalogs of major nationwide distributors. All items were depreciated in value to allow for age, wear and tear. Depreciated contents values were then related to depreciated structure values in order to develop relationships which express contents as a percent of structure value by ranges, as shown in Table 3. Depth-damage relationships for contents are shown in Table 4.

Non-residential. Non-residential depth-damage relationships were based on contractor engineering expertise and field interviews which were carried out during the LPHPP analysis. Structural values were based on construction cost data published by Marshall and Swift Publication Company. Depth-damage relationships for non-residential structures are shown in Table 5.

Relationships for non-residential contents as a percent of structure values were also developed. These relationships were based on interviews with management personnel of sample structures, and included the value of all contents, i.e., machinery and equipment, supplies, furnishings, stock, goods in process, and finished goods. Table 6 displays the non-residential contents/structure value relationships, while Table 7 shows the depth-damage relationships for non-residential contents.

STAGE-FREQUENCY CURVES. Stage-frequency curves, which express the annual probability of various levels of flooding under each plan analyzed, were developed for each reach. They are further discussed and displayed in Appendix C.

DAMAGE ANALYSIS

Damage Computations. Damage was calculated using the Hydrologic Engineering Center's (HEC) Flood Damage Analysis Package, flood plain structure inventories, and the depth-damage relationships previously described, together with stage-frequency curves for each hydraulically consistent reach. Stage-frequency curves were adjusted for slope within each reach by 1 foot incremental changes in the 100-year reference flood water surface elevations. These reference flood elevations were assigned to structure cards

Table 3

CONTENTS AS A PERCENT
OF STRUCTURAL VALUE
Residential

Structure Value Range	Contents as a Percent of Structure Value	Contents Value Range
($)	(%)	($)
000 - 10,000	75	000 - 7,500
10,001 - 20,000	73	7,300 - 14,600
20,001 - 30,000	70	14,600 - 21,000
30,001 - 40,000	66	21,000 - 26,400
40,001 - 50,000	62	26,400 - 31,000
50,001 - 60,000	57	31,000 - 34,200
60,001 - 70,000	53	34,200 - 37,100
70,001 - 80,000	51	37,100 - 40,800
80,001 - 90,000	49	40,800 - 44,100
90,001 -100,000	48	44,100 - 48,000
>100,000	47	>48,000

Source: DACW-38-79-C-0023 Output, October 1980, US Army Engineer District, New Orleans contract with CH2MHill, updated to 1983 price levels.

Table 4

FRESHWATER DEPTH-DAMAGE RELATIONSHIPS
for
Residential Contents

Depth of Flooding (Ft.)	Percent Damage To Contents One Story & Mobile Homes (%)	Two Story (%)
0.0	0.0	0.0
0.5	11.5	10.0
1.0	21.5	16.0
1.5	31.0	20.0
2.0	39.7	23.6
2.5	46.8	26.2
3.0	52.5	28.1
3.5	57.5	30.0
4.0	61.7	30.3
4.5	64.8	32.4
5.0	67.3	33.5
5.5	69.3	34.3
6.0	70.7	35.0
6.5	71.7	35.5
7.0	72.6	36.0
7.5	73.6	36.5
8.0	74.1	37.0
8.5	74.8	37.4
9.0	75.7	37.9
9.5	76.1	38.5
10.0	76.6	39.3
10.5	77.1	41.6
11.0	77.5	44.8
11.5	77.8	47.5
12.0	78.0	50.5
12.5	78.1	53.0
13.0	78.2	55.9
13.5	78.4	59.0
14.0	78.6	62.0
14.5	78.8	64.6
15.0	79.0	66.9

Source: DACW38-79-C-0023 Output, October 1980, US Army Engineer District, New Orleans, contract with CH2MHill.

Table 5

FRESHWATER DEPTH-DAMAGE RELATIONSHIP
for
Non-Residential Structures

Depth of Flooding (Ft.)	Percent Damage to Structures (%)
0.0	0.0
0.5	4.9
1.0	8.6
1.5	11.9
2.0	14.3
2.5	16.7
3.0	18.4
3.5	19.5
4.0	20.6
4.5	21.4
5.0	22.0
5.5	22.1
6.0	22.2
6.5	22.3
7.0	22.4
7.5	23.0
8.0	23.8
8.5	24.7
9.0	25.9
9.5	27.3
10.0	29.0
10.5	30.8
11.0	33.0
11.5	35.2
12.0	37.0
12.5	38.8
13.0	40.0
13.5	41.2
14.0	41.9
14.5	42.1
15.0	42.3

Source: DACW38-79-C-0023 Output, October 1980, US Army Engineer District, New Orleans, contract with CH2MHill.

Table 6

NON-RESIDENTIAL CONTENTS VALUE
EXPRESSED AS A PERCENT OF STRUCTURAL VALUE

Category	Contents Value as a % of Structural Value
	(%)
Business Services	109
Public Gathering Places	24
Cleaning, Maintenance and Grooming	209
Contractor Operations	97
Department Stores	205
Eating and Drinking Establishments	102
Gas Service Stations	83
Grocery Stores	84
Food Stores (Specialty)	98
Home and Auto Supplies, Appliances	127
Medical Buildings	41
Proprietary (Drug) Stores	129
Repair Service	152
Ready-to-Wear	190
Miscellaneous	113

Source: DACW38-79-C-0023 Output, October 1980, US Army Engineer District, New Orleans contract with CH2MHill.

Table 7
FRESHWATER DEPTH-DAMAGE RELATIONSHIPS
for
Non-Residential Contents

Depth of Flooding Over Ground Floor	Busines Service	Pub Gathering, Communications Transportation, Utilities	Cleaning, Maintenance, Grooming	Contractor Operation	Department Stores	Eating and Drinking Establish.	Gas Service Stations	Grocery Stores
(Ft.)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.5	14.0	4.0	21.0	14.5	2.0	3.0	10 0	30.0
1.0	25.0	7.8	36.0	21.0	9.0	13.8	15.5	40.0
1.5	32.3	10.7	46.8	27.0	15.0	24.0	21.3	47.0
2.0	39.5	13.2	55.0	33.0	20.0	32.0	26.6	52.0
2.5	45.0	15.2	61.0	37.5	25.0	39.0	32.5	56.8
3.0	50.0	17.0	66.0	42.0	29.0	45.0	39.9	60.3
3.5	54.0	18.9	69.0	45.9	33.1	50.5	44.9	64.0
4.0	57.5	20.0	71.0	50.5	37.3	54.7	50.5	67.0
4.5	60.0	21.5	72.8	54.0	40.5	58.8	55.5	70.0
5.0	62.0	22.9	74.0	57.0	43.5	62.0	60.0	72.5
5.5	63.2	24.0	75.0	61.0	46.0	64.3	64.5	74.8
6.0	64.0	25.0	76.0	64.5	48.7	66.0	69.0	76.8
6.5	64.7	26.0	77.5	67.5	51.0	67.7	72.8	78.0
7.0	65.2	27.0	78.0	70.0	53.0	69.0	76.5	79.5
7.5	65.8	28.0	78.7	72.0	55.0	70.2	80.3	80.7
8.0	66.0	29.2	79.4	74.0	57.0	71.0	84.0	81.8
8.5	66.0	30.1	79.8	75.5	59.0	72.0	87.0	82.3
9.0	66.0	31.0	80.0	77.5	60.8	72.7	90.0	83.3
9.5	66.2	32.0	80.0	78.5	62.3	73.5	92.0	84.0
10.0	66.3	32.7	80.0	80.0	63.8	74.0	93.8	84.5
10.5	66.4	33.5	80.0	81.0	65.0	74.8	94.7	85.3
11.0	66.5	34.0	80.1	82.0	66.1	75.7	95.9	85.7
11.5	66.6	34.5	80.1	82.5	67.5	76.0	96.2	86.0
12.0	66.8	34.9	80.1	83.0	68.3	76.2	96.3	86.1
12.5	67.0	35.5	80.1	83.5	69.7	76.4	97.0	86.1
13.0	67.3	35.8	80.2	84.0	70.6	76.6	97.4	86.2
13.5	67.4	35.9	80.2	84.5	71.5	76.8	97.5	86.2
14.0	67.6	36.0	80.3	85.0	72.1	77.0	97.6	86.3
14.5	67.8	36.2	80.3	85.4	73.0	77.2	97.7	86.4
15.0	68.0	36.4	80.4	85.8	73.9	77.4	97.8	86.5

Table 7 continued
FRESHWATER DEPTH-DAMAGE RELATIONSHIPS
for
Non-Residential Contents

Depth of Flooding Over Ground Floor	Specialty Food Stores	Home and Auto Supplies, Appliances	Medical Buildings	Proprietary (Drug) Stores	Repair Services	Ready-to-Wear	Miscell.
(Ft.)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.5	13.0	26.0	29.0	11.0	14.0	16.0	14.7
1.0	28.0	31.5	33.2	18.0	22.0	33.3	24.0
1.5	36.7	37.3	35.5	26.6	30.0	46.0	31.5
2.0	43.7	42.4	37.7	34.5	37.4	57.1	38.2
2.5	50.0	48.0	39.4	43.0	45.3	65.0	43.8
3.0	55.0	53.8	40.9	51.0	54.0	72.0	48.9
3.5	58.4	59.2	42.2	60.0	62.8	77.5	53.3
4.0	61.4	63.7	43.7	68.4	71.0	82.0	57.4
4.5	64.4	67.0	44.8	77.0	77.9	85.0	60.8
5.0	66.7	69.5	46.0	85.0	83.8	87.7	63.6
5.5	69.2	71.8	47.0	93.1	89.1	90.1	66.1
6.0	70.8	73.6	47.9	97.2	92.8	92.0	68.1
6.5	72.3	75.2	48.9	99.0	95.6	93.6	69.8
7.0	73.7	76.5	49.7	99.0	97.8	94.8	71.3
7.5	75.0	77.8	50.3	99.1	99.0	96.0	72.4
8.0	76.0	78.8	51.0	99.3	100.0	97.1	73.5
8.5	77.0	79.8	51.8	99.5	100.0	98.2	74.3
9.0	78.0	80.3	52.0	99.7	100.0	98.3	75.1
9.5	78.7	80.9	52.6	99.8	100.0	98.9	75.7
10.0	79.4	81.3	53.0	99.9	100.0	99.6	76.3
10.5	80.0	81.6	53.5	99.9	100.0	100.0	76.8
11.0	80.5	81.9	53.9	100.0	100.0	100.0	77.3
11.5	81.3	82.0	54.2	100.0	100.0	100.0	77.6
12.0	81.7	82.1	54.4	100.0	100.0	100.0	77.8
12.5	82.0	82.1	54.8	100.0	100.0	100.0	78.1
13.0	82.1	82.2	55.1	100.0	100.0	100.0	78.4
13.5	82.2	82.2	55.4	100.0	100.0	100.0	78.5
14.0	82.3	82.2	55.7	100.0	100.0	100.0	78.8
14.5	82.3	83.3	55.8	100.0	100.0	100.0	79.0
15.0	82.3	83.3	55.9	100.0	100.0	100.0	79.2

Source: DACW38-79-C-0023 Output, October 1980, US ARmy Engineer District, New Orleans contract with CH2MHill.

according to minibands, each representing a 1-foot increment in the reference flood elevation at its center, and designed to cut a path perpendicular to the flows of the various rivers and tributaries while taking into account hydraulic obstructions and geographic inconsistencies.

The Structure Inventory for Damage Analysis (SID) computer program was used to calculate elevation-damage curves. Adjustments were made to the data to correct for unnaturally extreme or frequent occurrences of flooding, and the hydraulic data was adjusted in coordination with the Hydraulics and Hydrology Branch (H&H) in order to account for the occurrence of natural levees along stream banks. Zero damage elevations were established at or above the 2-year storm elevation in most cases and the appropriate increment established to develop well-defined elevation-damage curves which were stored in a random access file, the HEC Data Storage System (HECDSS) file, under path names matching those of the stored elevation-probability data provided by H&H.

The Expected Annual Flood Damage Computation (EAD) computer program was used to access the HECDSS file and weight the damage corresponding to each magnitude of flooding by the percent chance of exceedance, and then sum the weighted damage to determine the expected annual damage. Damages were calculated for single-family one-story and two-story homes; mobile homes; the contents of all residential structures; commercial structures; and the contents of commercial structures, for each reach and for all with and without project conditions considered for each basin.

DAMAGE PRESENTATION. Expected annual damages to existing development for each hydrologic condition studied in each watershed are displayed in Table 8. This table also shows inundation reduction benefits for each NED plan, as detailed later in this appendix, by sub-basin for each watershed.

EMERGENCY RELIEF AND EVACUATION\REOCCUPATION COSTS

Benefits attributed to this category are defined as the elimination or lowering of emergency and evacuation costs. These costs include flood fighting efforts, disaster relief,

TABLE 8

COMPARISON OF BENEFITS WITH AND WITHOUT 10 YEAR COMITE RIVER DIVERSION IN PLACE

(STRUCTURES & CONTENTS, IN THOUSANDS)

BLACKWATER BAYOU WATERSHED

		WITHOUT 10 YEAR DIVERSION		WITH 10 YEAR DIVERSION	
BASIN NUMBER	REACH	DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN BW-P2	DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN BW-P2
13	A	$225.75	$0.00	$27.57	$0.00
	B	$223.23	$181.45	$213.80	$173.13
	C	$129.48	$103.16	$129.48	$103.16
	D	$233.18	$192.37	$233.18	$192.37
	E	$17.68	$13.54	$17.68	$13.54
	F	$2,989.20	$2,337.71	$2,989.20	$2,337.71
	G	$408.90	$328.15	$408.90	$328.15
	H	$10.73	$0.00	$10.73	$0.00
	I	$446.71	$153.73	$332.43	$168.74
TOTALS:		$4,684.86	$3,310.11	$4,362.97	$3,316.80

BEAVER BAYOU WATERSHED

BASIN NUMBER	REACH	DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN BBN-P2	DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN BBN-P2
14	A	$0.00	$0.00	$0.00	$0.00
	B	$25.97	$0.00	$11.76	$0.00
	C	$19.66	$1.92	$8.48	$0.12
	D	$24.36	$24.26	$5.20	$5.17
	E	$437.05	$431.04	$437.05	$431.04
	F	$314.30	$314.19	$314.30	$314.19
	G	$2,264.99	$2,007.31	$2,264.99	$2,007.31
	H	$3,467.85	$2,908.88	$3,467.85	$2,908.88
	I	$1,334.94	$1,230.98	$1,334.94	$1,230.98
	J	$37.10	$37.02	$37.10	$37.02
	K	$297.65	$256.28	$297.65	$256.28
	L	$540.97	$491.58	$540.97	$491.58
TOTALS:		$8,764.84	$7,703.46	$8,720.29	$7,682.57

WARD'S CREEK WATERSHED

WARD'S CREEK

BASIN NUMBER	REACH	DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN WCC-P4A5	DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN WCC-P4A5
21	B	$59.33	$19.83	$59.33	$19.83
	C	$270.76	$124.99	$270.76	$124.99
	D	$0.66	$0.00	$0.66	$0.00
	E	$3.99	$0.00	$3.99	$0.00
	F	$78.03	$0.00	$78.03	$0.00
	G	$20.14	$0.00	$20.14	$0.00
TOTALS:		$432.91	$144.82	$432.91	$144.82

TABLE 8 continued

WARD'S CREEK WATERSHED continued

		WITHOUT 10 YEAR DIVERSION			WITH 10 YEAR DIVERSION		
BAYOU DUPLANTIER							
BASIN NUMBER	REACH	DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN WCC-P4A5		DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN WCC-P4A5	
25	A	$193.07	$49.76		$193.07	$49.76	
DAWSON CREEK							
BASIN NUMBER	REACH	DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN WCC-P4A5		DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN WCC-P4A5	
26	A	$706.26	$37.20		$706.26	$37.20	
NORTH BRANCH-WARD'S CREEK							
BASIN NUMBER	REACH	DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN WCC-P4A5		DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN WCC-P4A5	
27	A	$375.12	$374.08		$375.12	$374.08	
	B	$106.03	$0.00		$106.03	$0.00	
	C	$178.37	$34.35		$178.37	$34.35	
TOTALS:		$659.52	$408.43		$659.52	$408.43	
DAWSON CREEK							
BASIN NUMBER	REACH	DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN WCC-P4A5		DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN WCC-P4A5	
30	A	$784.61	$103.70		$784.61	$103.70	
WARD'S CREEK							
BASIN NUMBER	REACH	DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN WCC-P4A5		DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN WCC-P4A5	
32	A	$226.14	$0.00		$205.44	$0.00	
	B	$439.75	$0.00		$430.55	$0.00	
TOTALS:		$665.89	$0.00		$635.99	$0.00	
		WITHOUT 10 YEAR DIVERSION			WITH 10 YEAR DIVERSION		
TOTAL WARD'S CREEK WATERSHED:		$3,442.26	$743.91		$3,412.36	$743.91	

TABLE 8 continued

		WITHOUT 10 YEAR DIVERSION		WITH 10 YEAR DIVERSION	
JONES CREEK WATERSHED					
JONES CREEK					
BASIN NUMBER	REACH	DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN JCCL-P1	DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN JCCL-P1
22	A	$27.87	$2.02	$17.62	$1.57
	B	$10.14	$7.24	$8.23	$6.38
	C	$744.44	$740.96	$724.84	$722.81
	D	$38.41	$38.40	$38.41	$38.40
TOTALS:		$820.86	$788.62	$789.10	$769.16
LIVELY BAYOU TRIBUTARY					
BASIN NUMBER	REACH	DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN JCCL-P1	DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN JCCL-P1
23	O	$2,060.69	$2,042.65	$2,060.69	$2,042.65
	P	$1,878.78	$1,878.04	$1,878.78	$1,878.04
TOTALS:		$3,939.47	$3,920.69	$3,939.47	$3,920.69
LIVELY BAYOU					
BASIN NUMBER	REACH	DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN JCCL-P1	DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN JCCL-P1
24	L	$278.07	$276.86	$278.07	$276.86
	M	$144.68	$144.01	$144.68	$144.01
	N	$1,421.67	$1,408.28	$1,421.67	$1,408.28
	N2	$124.15	$109.68	$124.15	$109.68
TOTALS:		$1,968.57	$1,938.83	$1,968.57	$1,938.83
WEINER CREEK					
BASIN NUMBER	REACH	DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN JCCL-P1	DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN JCCL-P1
28	G	$2.58	$2.58	$2.58	$2.58
	H	$0.29	$0.29	$0.29	$0.29
	I	$65.19	$65.19	$65.19	$65.19
TOTALS:		$68.06	$68.06	$68.06	$68.06
		WITHOUT 10 YEAR DIVERSION		WITH 10 YEAR DIVERSION	
TOTAL JONES CREEK WATERSHED:		$6,796.96	$6,716.20	$6,765.20	$6,696.74

TABLE 8 continued

		WITHOUT 10 YEAR DIVERSION		WITH 10 YEAR DIVERSION	
BAYOU FOUNTAIN WATERSHED					
BASIN NUMBER	REACH	DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN BF10B	DAMAGES WITHOUT PROJECT	BENEFITS NED PLAN BF10B
29	A	$175.38	$70.36	$155.44	$64.39
	B	$0.00	$0.00	$0.00	$0.00
	C	$13.75	$5.18	$13.75	$5.18
	D	$246.79	$179.07	$246.79	$184.17
	D1	$106.22	$68.45	$98.44	$68.33
	D2	$67.03	$41.81	$62.67	$43.51
	E	$13.36	$6.96	$13.36	$6.96
	G	$267.18	$34.95	$267.18	$34.95
	H	$19.19	$3.54	$19.19	$3.54
	I	$69.67	$6.65	$69.67	$6.65
	I2	$198.80	$17.16	$198.80	$17.16
	K	$1.60	$0.00	$1.60	$0.00
	L	$56.83	$0.00	$56.83	$0.00
	M	$256.70	$0.00	$256.70	$0.00
TOTALS:		$1,492.50	$434.13	$1,460.42	$434.84
NED PLANS		WITHOUT 10 YEAR DIVERSION		WITH 10 YEAR DIVERSION	
TOTAL ALL BASIN		$25,181.42	$18,907.81	$24,721.24	$18,874.86

debris removal, and increased costs of police and military patrols. A 1990 study by the Vicksburg District estimated an expenditure of $860 per structure for emergency relief; $300 per structure for evacuation/reoccupation; $756 per structure for flood fighting expenses; $62 per structure for COE emergency operations expenses; and $35 per structure for rescue/patrol operations due to flooding experienced in their state. This total of $2,013 per structure was multiplied by the number of structures anticipated to have water at, or above the first floor level for the 2-, 5-, 10-, 25-, 50-, 100-, and 500-year storms for the Bayou Fountain Watershed. In the other watersheds the 10-, 25-, 50-, 100-, and 500-year storms were used in this analysis. These totals were entered into an FDA DSS damage frequency file as absolute damage levels weighted by the frequencies of their respective storm elevations for both with and without project conditions. Using EAD an integral was taken for the total damage due to emergency relief, evacuation, and reoccupation; and the expected annual costs and cost reductions were calculated. The resulting benefits are as follows for the NED or Recommended Plans for each watershed.

EMERGENCY BENEFITS WITHOUT COMITE RIVER DIVERSION

Plan	Hydrologic Basin	Benefits
BW-P2	Blackwater Bayou	$36,900
BBN-P2	Beaver Bayou	$61,000
WCC-P4A5	Wards Creek	$31,700
WCC-P4A6	Wards Creek	$35,900
JCCL-P1	Jones Creek	$141,400
BF-10B	Bayou Fountain	$47,700

EMERGENCY BENEFITS WITH COMITE RIVER DIVERSION IN PLACE

Plan	Hydrologic Basin	Benefits
BW-P2	Blackwater Bayou	$34,200
BBN-P2	Beaver Bayou	$58,600
WCC-P4A5	Wards Creek	$31,700
WCC-P4A6	Wards Creek	$35,900
JCCL-P1	Jones Creek	$140,600
BF-10B	Bayou Fountain	$41,000

FEDERAL INSURANCE ADMINISTRATION COSTS SAVED

The net cost of the Federal Flood Insurance Program is the cost of administration, which is currently $125 per policy. Reduction or elimination of this cost is considered an indirect benefit of the project. This is achieved by any project which results in such property no longer being subject to flooding by a 100-year stage.

In order to determine the magnitude of this benefit, all of the residential properties in the project were considered. The analysis began with the following conditions based on observation and experience as reported by Flood Insurance Administration (FIA) officials. The F.I.A. indicates that the percentage of properties currently covered by flood insurance differs by flood zone and those proportions are: 100% for the 0 to 25-year zone; 80% for the 25 to 50-year zone; 60% for the 50 to 100-year zone; and none above the 100-year stage. Further, FIA estimates that 30% to 50% of the property owners will continue to maintain flood insurance coverage in spite of any protection they may receive from a project. Accordingly, the potential dollar benefit of protection from the 100-year stage was reduced by 40% such that the adjusted potential benefit per policy was $66.60.

The structure files were sorted according to residential structures found in the 0 to 25, 25 to 50, and 50 to 100-year flood zones. Their total elevations were then adjusted for slope and compared to the with project 100-year stage and those which exceeded that stage were sorted listed and counted. The number of structures which were no longer subject to flooding by the 100-year stage with the project in place were then assumed to have flood insurance in their flood zone. This number was then multiplied by the adjusted potential benefit for each flood zone and the sum of these benefits for each zone of each basin was then reported (see Tables 9 and 10).

TABLE 9
EAST BATON ROUGE F.I.A. BENEFITS

FIA COST PER POLICY =	$125.00	
PROPORTION W/POLICY	0 - 25 YR=	100%
	25 - 50 YR=	80%
	50-100 YR=	60%

PROPORTION WHO MAINTAIN POLICIES IN SPITE OF PROJECT IMPROVEMENT: 40%

BASIN NUMBER 13 — BLACKWATER BAYOU WATERSHED

NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLAN BW-P2

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
27	50	149	$11,730.00

BASIN NUMBER 14 — BEAVER BAYOU WATERSHED

NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLAN BBN-P2

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
191	19	100	$19,965.00

BASIN NUMBER 21 — WARD'S CREEK WATERSHED

BASIN: WARD'S CREEK

NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLAN WCC-P4A5

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
0	0	28	$1,260.00

BASIN NUMBER 25

BASIN: BAYOU DUPLANTIER

NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLAN WCC-P4A5

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
0	0	13	$585.00

TABLE 9
F.I.A. BENEFITS continued

BASIN
NUMBER BASIN: DAWSON CREEK
26
NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLAN WCC-P4A5

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
0	0	0	$0.00

BASIN
NUMBER BASIN: NORTH BRANCH-WARD'S CREEK
27
NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLAN WCC-P4A5

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
87	33	168	$16,065.00

BASIN
NUMBER BASIN: DAWSON CREEK
30
NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLAN WCC-P4A5

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
0	0	4	$180.00

BASIN
NUMBER BASIN: WARD'S CREEK
32
NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLAN WCC-P4A5

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
0	0	0	$0.00

TOTAL BENEFITS FOR WARD'S CREEK WATERSHED WITH PLAN WCC-P4A5: $18,090.00

TABLE 9
F.I.A. BENEFITS continued

BASIN JONES CREEK WATERSHED
NUMBER BASIN: JONES CREEK
22
NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLAN JCCL-P1 ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
96	144	105	$20,565.00

BASIN
NUMBER BASIN: LIVELY BAYOU TRIBUTARY
23
NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLAN JCCL-P1 ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
653	118	47	$58,170.00

BASIN
NUMBER BASIN: LIVELY BAYOU
24
NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLAN JCCL-P1 ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
220	76	17	$21,825.00

BASIN
NUMBER BASIN: WEINER CREEK
28
NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLAN JCCL-P1 ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
8	13	2	$1,470.00

TOTAL BENEFITS FOR JONES CREEK WATERSHED FOR PLAN JCCL-P1: $102,030.00

TABLE 9
F.I.A. BENEFITS continued

BASIN NUMBER 29 — BAYOU FOUNTAIN WATERSHED

NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLAN BF10B

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
0	1	6	$330.00

TABLE 10
EAST BATON ROUGE F.I.A. BENEFITS
WITH 10-YEAR UNCONTROLLED COMITE RIVER DIVERSION IN PLACE

FIA COST PER POLICY =	$125.00	
PROPORTION W/POLICY	0 - 25 YR=	100%
	25 - 50 YR=	80%
	50-100 YR=	60%

PROPORTION WHO MAINTAIN POLICIES IN SPITE OF PROJECT IMPROVEMENT: 40%

BASIN NUMBER 13 — BLACKWATER BAYOU WATERSHED

NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLAN BW-P2

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
27	50	74	$8,355.00

BASIN NUMBER 14 — BEAVER BAYOU WATERSHED

NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLAN BBN-P2

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
178	18	93	$18,615.00

BASIN NUMBER 21 — WARD'S CREEK WATERSHED

BASIN: WARD'S CREEK

NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLANS WCC-P4A5

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
0	0	28	$1,260.00

BASIN NUMBER 25

BASIN: BAYOU DUPLANTIER

NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLANS WCC-P4A5

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
0	0	13	$585.00

TABLE 10
F.I.A. BENEFITS continued

BASIN NUMBER 26 — BASIN: DAWSON CREEK

NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLANS WCC-P4A5

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
0	0	0	$0.00

BASIN NUMBER 27 — BASIN: NORTH BRANCH-WARD'S CREEK

NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLAN WCC-P4A5

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
87	33	168	$16,065.00

BASIN NUMBER 30 — BASIN: DAWSON CREEK

NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLANS WCC-P4A5

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
0	0	4	$180.00

BASIN NUMBER 32 — BASIN: WARD'S CREEK

NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLANS WCC-P4A5

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
0	0	0	$0.00

TOTAL BENEFITS FOR WARD'S CREEK WATERSHED WITH PLAN WCC-P4A5: $18,090.00

TABLE 10
F.I.A. BENEFITS continued

BASIN JONES CREEK WATERSHED
NUMBER BASIN: JONES CREEK
22

NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLAN JCCL-P1

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
99	143	104	$20,685.00

BASIN
NUMBER BASIN: LIVELY BAYOU TRIBUTARY
23

NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLAN JCCL-P1

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
653	118	47	$58,170.00

BASIN
NUMBER BASIN: LIVELY BAYOU
24

NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLAN JCCL-P1

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
220	76	17	$21,825.00

BASIN
NUMBER BASIN: WEINER CREEK
28

NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLAN JCCL-P1

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
8	13	2	$1,470.00

TOTAL BENEFITS FOR JONES CREEK WATERSHED FOR PLAN JCCL-P1: $102,150.00

TABLE 10
F.I.A. BENEFITS continued

BASIN NUMBER 29 — BAYOU FOUNTAIN WATERSHED

NUMBER OF STRUCTURES MOVING TO ABOVE 100 YEAR STAGE WITH PROJECT

PLAN BF10B

ZONE OF ORIGIN 0 - 25 YR	ZONE OF ORIGIN 25 - 50 YR	ZONE OF ORIGIN 50 - 100 YR	NET BENEFITS
0	0	6	$270.00

FILL REDUCTION BENEFITS

General. When new areas are developed in East Baton Rouge Parish, much of the land will require the use of fill material in order to bring slab elevations up to the level of the 100-year flood event. This is necessary to comply with flood plain regulations. Benefits will accrue to future homeowners to the extent that a flood reduction project lowers the elevation of the 100-year flood event, since for every 1 foot decrease in the 100-year event, the homeowner may use 1 foot less of fill material under the slab of the house.

In computing the fill reduction benefits of the project, consideration was given to the number of acres expected to be developed, the timing of the development, the reduction in the 100-year flood event, and the estimated cost of filling land in the Parish. The number of acres expected to be developed and the timing of the development were obtained from a 1988 land use study prepared by the Louisiana State Planning Office. The elevation lowerings of the 100-year flood event brought about by the projects under consideration were obtained from HEC II outputs supplied by H&H. Finally, the estimated cost per acre to fill land in the Parish was supplied by the District's Cost Engineering and Specification Section.

Expected Land Use. The land-use study provides projections for land use in each of the 13 sub-basins under consideration, presented in 10-year increments from 1990 to 2040. Since we are using 1995 as a base year in this analysis, some adjustments of the data were necessary. Between the years 2040 and 2045 we assumed that growth would continue at the rate shown in the land use study for the time period between 2030 and 2040. Using this assumption, and rates of growth consistent with the land use study for earlier periods, the number of acres expected to be developed during each ten-year period between 1995 and 2045 was arrived at.

Benefit Calculations. Benefit calculations were begun by dividing the increased number of acres developed in each 10-year period by ten to obtain the average number of acres expected to be developed per year in each sub-basin. It was

assumed that twenty percent of this area will be used for road construction when the area is developed and will, therefore, not require any fill material. It was further assumed that only a portion of residential lots will be filled by homeowners. While homeowners with small lots typically fill their entire lots, homeowners with lots which are relatively large compared to the size of their homes may fill less than half of their land. To be conservative, it was assumed that on average only 50 percent of the newly developed land will be filled by homeowners.

In the past, significant development has taken place both inside and outside of the flood plain for the areas being studied. We assumed that when these areas are further developed, the percentage of development which will occur inside of the flood plain of each sub-basin will remain consistent with the pattern exhibited in the past. Since no benefits will accrue to homeowners who develop land outside of the flood plain, the number of acres of land on which benefits were computed were reduced by the percentage of development expected to occur outside of the flood plains of the various sub-basins.

Using the flood elevation lowerings in each subbasin, the average increase in acres developed per year, the percentage of land to be filled, the percentage of new development expected to occur within the 100-year flood plain of each sub-basin, and the price of fill, the benefits in each year were computed by using the following formula:

Benefit per Year = Increase in Acres Developed X Percent of Land Developed in Flood Plain X

Percentage of Land Expected to be Filled X Reduction in 100 year Flood X Price of Fill Per Acre-Foot

The product of the first four factors in the above equation is the volume of fill material which will not be needed in the newly developed areas if a project is put in place. Multiplying that figure by the price of the fill gives us the benefit per year, or the cost of filling land which will not be incurred with a project in place.

The present value of the benefits generated each year was amortized over the 50-year life of the project to give average annual benefits. These values given above may be somewhat understated since benefits were computed only on land which lies within the 100-year flood plain both with and without the project in place. While it is recognized that areas which are within the without project 100-year flood plain but not the with-project 100-year flood plain will require less fill, the computation of fill reduction benefits in these areas was not undertaken. It was determined that fill reduction benefits for structures removed from the 100-year floodplain would be minimal and, therefore, they were not included (see Tables 11A and 11B).

RECREATION BENEFITS. The Recreation Analysis section of the Environmental Appendix contains a detailed discussion of the recreation benefit calculations. The average annual recreation benefits are estimated to be $577,000 and are experienced only in the Jones Creek Watershed.

EROSION CONTROL BENEFITS. During recent years, bank recession problems have been reported at several locations along the five watersheds in East Baton Rouge Parish. Most notably, erosion has occurred along the banks of Jones Creek, and along a 1.2-mile stretch of Wards Creek between I-10 and I-12. The proposed channel improvements to these two watersheds, which includes lining the banks with concrete, will have the added benefit of eliminating the erosion problem. In order to quantify the additional benefits that will result from the project, the dollar value of the average annual land losses during the 50-year life of the project must be determined.

The annual bank loss in linear feet can be calculated by multiplying the bank loss rate per year during the 50-year period by the thickness of the loess. Each of these values was obtained from CELMN-ED-F, and is discussed in Section 5

TABLE 11A
FILL REDUCTION BENEFITS FOR: EAST BATON ROUGE

Discount Rate: 8.000%
Proportion of Land Filled: 40%
Price Per Cubic Yard of Fill: $4.50

BLACKWATER BAYOU WATERSHED

Sub-Basin: 13 Blackwater Bayou PLAN: BW-P2
Reduction In 100 Year Stage= 0.96 Feet
Percent Acres Developed In Flood Plain: 19.0%

Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	55.75	6562.29	$29,530	$198,151	
2005-2014	51.65	6079.68	$27,359	$85,032	
2015-2024	45.70	5379.31	$24,207	$34,849	
2025-2034	42.00	4943.79	$22,247	$14,835	
2035-2044	42.80	5037.96	$22,671	$7,002	
					$27,782

BEAVER BAYOU WATERSHED

Sub-Basin: 14 Beaver Bayou PLAN: BBN-P2
Reduction In 100 Year Stage= 1.75 Feet
Percent Acres Developed In Flood Plain: 77.0%

Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	51.60	44870.86	$201,919	$1,354,892	
2005-2014	47.75	41522.93	$186,853	$580,752	
2015-2024	42.25	36740.19	$165,331	$238,016	
2025-2034	38.90	33827.06	$152,222	$101,506	
2035-2044	39.70	34522.73	$155,352	$47,984	
					$189,901

WARD'S CREEK WATERSHED

Sub-Basin: 21 Ward's Creek PLAN: WCC-P4A5
Reduction In 100 Year Stage= 0.2685 Feet
Percent Acres Developed In Flood Plain: 12.0%

Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	0.00	0.00	$0	$0	
2005-2014	0.00	0.00	$0	$0	
2015-2024	0.00	0.00	$0	$0	
2025-2034	0.00	0.00	$0	$0	
2035-2044	0.00	0.00	$0	$0	
					$0

TABLE 11A continued

Sub-Basin: 25		Bayou Duplantier		PLAN: WCC-P4A5	
		Reduction In 100	Year Stage=	0.3 Feet	
	Percent	Acres Developed	In Flood Plain:	18.0%	
Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	3.10	108.03	$486	$3,262	
2005-2014	2.95	102.80	$463	$1,438	
2015-2024	2.60	90.61	$408	$587	
2025-2034	2.20	76.67	$345	$230	
2035-2044	2.10	73.18	$329	$102	
					$459

Sub-Basin: 26		Dawson Creek		PLAN: WCC-P4A5	
		Reduction In 100	Year Stage=	0 Feet	
	Percent	Acres Developed	In Flood Plain:	11.0%	
Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	0.00	0.00	$0	$0	
2005-2014	0.00	0.00	$0	$0	
2015-2024	0.00	0.00	$0	$0	
2025-2034	0.00	0.00	$0	$0	
2035-2044	0.00	0.00	$0	$0	
					$0

Sub-Basin: 27		North Branch- Ward's Creek		PLAN: WCC-P4A5	
		Reduction In 100	Year Stage=	1.92 Feet	
	Percent	Acres Developed	In Flood Plain:	7.0%	
Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	0.00	0.00	$0	$0	
2005-2014	0.00	0.00	$0	$0	
2015-2024	0.00	0.00	$0	$0	
2025-2034	0.00	0.00	$0	$0	
2035-2044	0.00	0.00	$0	$0	
					$0

TABLE 11A continued

Sub-Basin: 30 Dawson Creek PLAN: WCC-P4A5

Reduction In 100 Year Stage= 0.2 Feet

Percent Acres Developed In Flood Plain: 22.0%

Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	12.15	345.00	$1,552	$10,417	
2005-2014	6.45	183.15	$824	$2,562	
2015-2024	0.65	18.46	$83	$120	
2025-2034	0.00	0.00	$0	$0	
2035-2044	0.00	0.00	$0	$0	
					$1,071

Sub-Basin: 32 Ward's Creek PLAN: WCC-P4A5

Reduction In 100 Year Stage= 0 Feet

Percent Acres Developed In Flood Plain: 16.0%

Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	22.60	0.00	$0	$0	
2005-2014	20.90	0.00	$0	$0	
2015-2024	18.50	0.00	$0	$0	
2025-2034	17.00	0.00	$0	$0	
2035-2044	17.30	0.00	$0	$0	
					$0

TOTAL FOR WARD'S CREEK WATERSHED-PLAN WCC-P4A5 $1,530.0

TABLE 11A continued

JONES CREEK WATERSHED

Sub-Basin: 22 Jones Creek PLAN: JCCL-P1

Percent Reduction In 100 Acres Developed Year Stage= 3.74 Feet In Flood Plain: 19.0%

Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	47.60	21828.21	$98,227	$659,111	
2005-2014	22.50	10317.95	$46,431	$144,310	
2015-2024	0.00	0.00	$0	$0	
2025-2034	0.00	0.00	$0	$0	
2035-2044	0.00	0.00	$0	$0	
					$65,674

Sub-Basin: 23 Lively Bayou Tributary PLAN: JCCL-P1

Percent Reduction In 100 Acres Developed Year Stage= 5.16 Feet In Flood Plain: 11.0%

Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	0.00	0.00	$0	$0	
2005-2014	0.00	0.00	$0	$0	
2015-2024	0.00	0.00	$0	$0	
2025-2034	0.00	0.00	$0	$0	
2035-2044	0.00	0.00	$0	$0	
					$0

Sub-Basin: 24 Lively Bayou PLAN: JCCL-P1

Percent Reduction In 100 Acres Developed Year Stage= 4.1 Feet In Flood Plain: 17.0%

Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	14.35	6454.62	$29,046	$194,900	
2005-2014	13.30	5982.33	$26,920	$83,671	
2015-2024	11.75	5285.14	$23,783	$34,239	
2025-2034	5.70	2563.86	$11,537	$7,693	
2035-2044	0.80	359.84	$1,619	$500	
					$26,240

TABLE 11A continued

Sub-Basin: 28		Weiner Creek		PLAN: JCCL-P1	
		Reduction In 100	Year Stage=	4.54 Feet	
	Percent	Acres Developed	In Flood Plain:	13.0%	

Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	0.10	38.09	$171	$1,150	
2005-2014	0.00	0.00	$0	$0	
2015-2024	0.00	0.00	$0	$0	
2025-2034	0.00	0.00	$0	$0	
2035-2044	0.00	0.00	$0	$0	
					$94

TOTAL FOR JONES CREEK WATERSHED-PLAN JCCL-P1: $92,008

BAYOU FOUNTAIN WATERSHED

Sub-Basin: 29		Bayou Fountain		PLAN: BF10B	
		Reduction In 100	Year Stage=	0.43 Feet	
	Percent	Acres Developed	In Flood Plain:	11.0%	

Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	74.40	2271.01	$10,220	$68,574	
2005-2014	68.85	2101.60	$9,457	$29,394	
2015-2024	60.90	1858.94	$8,365	$12,043	
2025-2034	56.10	1712.42	$7,706	$5,139	
2035-2044	57.20	1746.00	$7,857	$2,427	
					$9,611

TABLE 11B
FILL REDUCTION BENEFITS FOR: EAST BATON ROUGE
WITH 10-YEAR UNCONTROLLED COMITE RIVER DIVERSION IN PLACE

Discount Rate:	8.000%
Proportion of Land Filled:	40%
Price Per Cubic Yard of Fill:	$4.50

BLACKWATER BAYOU WATERSHED

Sub-Basin: 13 Blackwater Bayou PLAN: BW-P2
Reduction In 100 Year Stage= 1.06 Feet
Percent Acres Developed In Flood Plain: 19.0%

Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	55.75	7245.86	$32,606	$218,792	
2005-2014	51.65	6712.99	$30,208	$93,890	
2015-2024	45.70	5939.66	$26,728	$38,479	
2025-2034	42.00	5458.77	$24,564	$16,380	
2035-2044	42.80	5562.74	$25,032	$7,732	
					$30,676

BEAVER BAYOU WATERSHED

Sub-Basin: 14 Beaver Bayou PLAN: BBN-P2
Reduction In 100 Year Stage= 1.66 Feet
Percent Acres Developed In Flood Plain: 77.0%

Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	51.60	42563.21	$191,534	$1,285,212	
2005-2014	47.75	39387.47	$177,244	$550,885	
2015-2024	42.25	34850.69	$156,828	$225,775	
2025-2034	38.90	32087.38	$144,393	$96,286	
2035-2044	39.70	32747.28	$147,363	$45,516	
					$180,135

WARD'S CREEK WATERSHED

Sub-Basin: 21 Ward's Creek PLAN: WCC-P4A5
Reduction In 100 Year Stage= 0.2685 Feet
Percent Acres Developed In Flood Plain: 12.0%

Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	0.00	0.00	$0	$0	
2005-2014	0.00	0.00	$0	$0	
2015-2024	0.00	0.00	$0	$0	
2025-2034	0.00	0.00	$0	$0	
2035-2044	0.00	0.00	$0	$0	
					$0

TABLE 11B continued

Sub-Basin: 25		Bayou Duplantier		PLAN: WCC-P4A5	
		Reduction In 100	Year Stage=	0.3	Feet
	Percent	Acres Developed	In Flood Plain:	18.0%	
Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	3.10	108.03	$486	$3,262	
2005-2014	2.95	102.80	$463	$1,438	
2015-2024	2.60	90.61	$408	$587	
2025-2034	2.20	76.67	$345	$230	
2035-2044	2.10	73.18	$329	$102	
					$459

Sub-Basin: 26		Dawson Creek		PLAN: WCC-P4A5	
		Reduction In 100	Year Stage=	0	Feet
	Percent	Acres Developed	In Flood Plain:	11.0%	
Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	0.00	0.00	$0	$0	
2005-2014	0.00	0.00	$0	$0	
2015-2024	0.00	0.00	$0	$0	
2025-2034	0.00	0.00	$0	$0	
2035-2044	0.00	0.00	$0	$0	
					$0

Sub-Basin: 27		North Branch- Ward's Creek		PLAN: WCC-P4A5	
		Reduction In 100	Year Stage=	1.92	Feet
	Percent	Acres Developed	In Flood Plain:	7.0%	
Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	0.00	0.00	$0	$0	
2005-2014	0.00	0.00	$0	$0	
2015-2024	0.00	0.00	$0	$0	
2025-2034	0.00	0.00	$0	$0	
2035-2044	0.00	0.00	$0	$0	
					$0

TABLE 11B continued

Sub-Basin: 30		Dawson Creek		PLAN: WCC-P4A5	
		Reduction In 100	Year Stage=	0.2 Feet	
	Percent	Acres Developed	In Flood Plain:	22.0%	
Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	12.15	345.00	$1,552	$10,417	
2005-2014	6.45	183.15	$824	$2,562	
2015-2024	0.65	18.46	$83	$120	
2025-2034	0.00	0.00	$0	$0	
2035-2044	0.00	0.00	$0	$0	
					$1,071

Sub-Basin: 32		Ward's Creek		PLAN: WCC-P4A5	
		Reduction In 100	Year Stage=	0.067 Feet	
	Percent	Acres Developed	In Flood Plain:	16.0%	
Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	22.60	156.35	$704	$4,721	
2005-2014	20.90	144.59	$651	$2,022	
2015-2024	18.50	127.98	$576	$829	
2025-2034	17.00	117.61	$529	$353	
2035-2044	17.30	119.68	$539	$166	
					$661

TOTAL FOR WARD'S CREEK WATERSHED-PLAN WCC-P4A5: $2,191.4

TABLE 11B continued

JONES CREEK WATERSHED

Sub-Basin: 22 Jones Creek PLAN: JCCL-P1

Percent Reduction In 100 Year Stage= 3.97 Feet

Acres Developed In Flood Plain: 19.0%

Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	47.60	23170.58	$104,268	$699,644	
2005-2014	22.50	10952.48	$49,286	$153,185	
2015-2024	0.00	0.00	$0	$0	
2025-2034	0.00	0.00	$0	$0	
2035-2044	0.00	0.00	$0	$0	
					$69,713

Sub-Basin: 23 Lively Bayou Tributary PLAN: JCCL-P1

Percent Reduction In 100 Year Stage= 5.16 Feet

Acres Developed In Flood Plain: 11.0%

Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	0.00	0.00	$0	$0	
2005-2014	0.00	0.00	$0	$0	
2015-2024	0.00	0.00	$0	$0	
2025-2034	0.00	0.00	$0	$0	
2035-2044	0.00	0.00	$0	$0	
					$0

Sub-Basin: 24 Lively Bayou PLAN: JCCL-P1

Percent Reduction In 100 Year Stage= 4.1 Feet

Acres Developed In Flood Plain: 17.0%

Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	14.35	6454.62	$29,046	$194,900	
2005-2014	13.30	5982.33	$26,920	$83,671	
2015-2024	11.75	5285.14	$23,783	$34,239	
2025-2034	5.70	2563.86	$11,537	$7,693	
2035-2044	0.80	359.84	$1,619	$500	
					$26,240

TABLE 11B continued

Sub-Basin: 28		Weiner Creek		PLAN: JCCL-P1	
		Reduction In 100	Year Stage=	4.54 Feet	
	Percent	Acres Developed	In Flood Plain:	13.0%	
Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	0.10	38.09	$171	$1,150	
2005-2014	0.00	0.00	$0	$0	
2015-2024	0.00	0.00	$0	$0	
2025-2034	0.00	0.00	$0	$0	
2035-2044	0.00	0.00	$0	$0	
					$94

TOTAL FOR JONES CREEK WATERSHED-PLAN JCCL-P1: $96,046

BAYOU FOUNTAIN WATERSHED

Sub-Basin: 29		Bayou Fountain		PLAN: BF10B	
		Reduction In 100	Year Stage=	0.44 Feet	
	Percent	Acres Developed	In Flood Plain:	11.0%	
Period of Analysis	Avg. Annual Acreage Increase	Reduction in Fill Required (Cubic Yards)	Benefits Per Year	PV of Benefits In Base Year (1995)	Average Annual Benefit
1995-2004	74.40	2323.83	$10,457	$70,169	
2005-2014	68.85	2150.48	$9,677	$30,077	
2015-2024	60.90	1902.17	$8,560	$12,323	
2025-2034	56.10	1752.24	$7,885	$5,258	
2035-2044	57.20	1786.60	$8,040	$2,483	
					$9,835

of the Engineering Appendix C. The annual loss can be converted to square feet by multiplying it by the number of linear feet in each land use category along the stream bank. A separate annual loss was calculated for each of the four land use categories. These categories include residential, commercial, industrial, and undeveloped. By multiplying the square footage by the value of the land per square foot, the dollar value of the loss per year can be determined. The land values for each land use category were provided by CELMN-RE. This process is repeated for each of the 50 years during the life of the project. The present values of the annual losses are totaled and then amortized over the 50 years in order to determine the average annual land losses.

Table 12 summarizes the average annual erosion control benefits for each of the two watersheds, according to the thickness of the loess in the basin. A total benefit for each watershed has also been provided.

TABLE 12
AVERAGE ANNUAL BANK RECESSION BENEFITS
($1,000's)

WATERSHED	THICKNESS OF LOESS 1.0	1.5	2.0	2.5	TOTAL ANNUAL BENEFITS
Jones Creek	43.4	101.9	217.4		362.7
Wards Creek (1.2 miles of No. Branch)				88.3	88.3

PRESENTATION OF AVERAGE ANNUAL BENEFITS AND COSTS

METHODOLOGY. The economic justification of the plans that are given detailed consideration is determined by comparing estimates of the average annual costs and average annual benefits which are expected to accrue over the life of the project. Participation in a project by the Federal government normally requires that average annual benefits equal or exceed average annual costs. The values estimated for benefits and costs at the time of accrual are made comparable by conversion to an equivalent time basis using a designated interest rate. The interest rate used in this analysis is 8 percent. The period of analysis, or project life, which was utilized was 50 years. The benefits and costs are expressed as the average annual value of the present worth of all expenditures and all plan outputs. These expenditures and outputs are measured at a specific point in time, the base year, which ranges from 1999 to 2006 depending upon which watershed is considered.

Annual Costs. To provide a basis for comparison with benefits, the costs are expressed as an average annual value of the present worth of the expenditures measured at the end of the installation period. These annual costs include interest and amortization of the initial investment, average annual maintenance and operation costs, and fish and wildlife mitigation costs.

Structural Plans. Structural measures considered to reduce flooding in East Baton Rouge Parish include clearing and snagging, channel enlargement, and concrete channel lining and combinations thereof for each of the watersheds.

Table 13 displays the interest and amortization, operation and maintenance costs, and the total average annual costs for each NED plan for all watersheds. It also displays the appropriate compound factors and values.

Table 14 shows the plans analyzed in the initial stages of the study. As indicated in the table all 6 plans for Ward Creek have costs that significantly exceed benefits. Reformulation of alternative plans was considered and two

TABLE 13
EAST BATON ROUGE PARISH COSTS

	8.00%	BLACKWATER BAYOU PLAN: BW-P2		BAYOU FOUNTAIN PLAN: BF-10B	
YEAR	COMPOUND FACTOR	VALUE	COMPOUND VALUE	VALUE	COMPOUND VALUE
11.5	2.42311	$0	$0	$0	$0
10.5	2.24362	60,000	134,617	0	0
9.5	2.07743	40,000	83,097	0	0
8.5	1.92354	0	0	0	0
7.5	1.78106	0	0	0	0
6.5	1.64913	250,000	412,282	0	0
5.5	1.52697	310,000	473,361	0	0
4.5	1.41386	285,000	402,951	260,000	367,604
3.5	1.30913	3,318,000	4,343,697	364,000	476,524
2.5	1.21216	5,780,000	7,006,276	807,000	978,212
1.5	1.12237	8,152,000	9,149,551	1,922,000	2,157,193
0.5	1.03923	3,495,000	3,632,111	1,308,000	1,359,313
-0.5	0.96225	0	0	0	0
-1.5	0.89097	0	0	0	0
-2.5	0.82497	0	0	85,000	70,123
-3.5	0.76387	0	0	14,000	10,694
	TOTALS	$21,690,000	$25,503,325	$4,760,000	$5,419,663
			0.08174		0.08174
			2,085,000 I&A		443,000 I&A
			64,000 O&M		37,000 O&M
			$2,149,000 AVERAGE ANNUAL		$480,000 AVERAGE ANNUAL

TABLE 13 continued

EAST BATON ROUGE PARISH COSTS

	0.0800	WARD CREEK PLAN: WCC-P4A5		JONES CREEK PLAN: JCCL-P1	
YEAR	COMPOUND FACTOR	VALUE	COMPOUND VALUE	VALUE	COMPOUND VALUE
11.5	2.42311	$0	$0	$0	$0
10.5	2.24362	0	0	137,000	307,376
9.5	2.07743	0	0	260,000	540,131
8.5	1.92354	0	0	460,000	884,830
7.5	1.78106	135,000	240,443	430,000	765,855
6.5	1.64913	34,000	56,070	566,000	933,407
5.5	1.52697	250,000	381,743	1,821,000	2,780,613
4.5	1.41386	320,000	452,436	6,165,000	8,716,457
3.5	1.30913	330,000	432,013	5,343,000	6,994,688
2.5	1.21216	320,000	387,891	12,564,000	15,229,559
1.5	1.12237	3,173,000	3,561,277	17,589,000	19,741,347
0.5	1.03923	4,889,000	5,080,798	7,255,000	7,539,617
-0.5	0.96225	19,000	18,283	0	0
-1.5	0.89097	0	0	0	0
-2.5	0.82497	0	0	0	0
-3.5	0.76387	0	0	0	0
	TOTALS	$9,470,000	$10,370,510	$52,590,000	$64,433,879

Ward Creek		Jones Creek	
0.08174		0.08174	
848,000	I&A	5,267,000	I&A
76,000	O&M	67,000	O&M
$924,000	AVERAGE ANNUAL	$5,334,000	AVERAGE ANNUAL

TABLE 13 continued

EAST BATON ROUGE PARISH COSTS

0.0800 BEAVER BAYOU
PLAN: BBN-P2

YEAR	COMPOUND FACTOR	VALUE	COMPOUND VALUE
11.5	2.42311	$0	$0
10.5	2.24362	0	0
9.5	2.07743	150,000	311,614
8.5	1.92354	36,000	69,248
7.5	1.78106	0	0
6.5	1.64913	200,000	329,826
5.5	1.52697	290,000	442,821
4.5	1.41386	290,000	410,020
3.5	1.30913	2,961,000	3,876,337
2.5	1.21216	5,856,000	7,098,400
1.5	1.12237	7,777,000	8,728,663
0.5	1.03923	3,030,000	3,148,868
-0.5	0.96225	0	0
-1.5	0.89097	0	0
-2.5	0.82497	0	0
-3.5	0.76387	0	0
	TOTALS	$20,590,000	$24,104,183

0.08174	
1,970,000	I&A
64,000	O&M
$2,034,000	AVERAGE ANNUAL

TABLE 14
EAST BATON ROUGE PARISH
Initial Economic Analysis
(1,000)

PLAN	FIRST COST	ANNUAL COST	INUNDATION REDUCTION BENEFITS	NET BENEFITS	B\C RATIO
WARD CREEK					
WCC-P1	$45,371	$4,350	$3,012	($1,338.32)	0.69
WCC-P2	$52,553	$5,037	$3,026	($2,010.77)	0.60
WCC-P3	$58,767	$5,632	$3,101	($2,530.82)	0.55
WCC-P4	$84,999	$8,144	$4,826	($3,317.74)	0.59
WCC-P5	$92,142	$8,828	$4,845	($3,982.87)	0.55
WCC-P6	$98,271	$9,414	$4,860	($4,554.22)	0.52
JONES CREEK					
JCCL-P1	$52,178	$4,389	$6,715	$2,326.00	1.53
JCCL-P2	$66,275	$5,865	$6,727	$862.00	1.15
JCCL-P3	$36,795	$3,259	$4,877	$1,617.60	1.50
JCCL-P4	$38,208	$3,384	$4,877	$1,492.99	1.44
BEAVER BAYOU					
BBN-P1	$12,060	$1,049	$6,081	$5,031.73	5.80
BBN-P2	$14,893	$1,290	$7,154	$5,863.67	5.55
BBN-P3	$16,317	$1,411	$7,209	$5,797.92	5.11
BBN-P4	$25,379	$2,252	$6,979	$4,726.58	3.10
BLACKWATER BAYOU					
BW-P1	$7,141	$637	$683	$45.54	1.07
BW-P2	$9,130	$821	$3,306	$2,485.00	4.03
BW-P3	$10,336	$908	$828	($79.87)	0.91
BW-P4	$12,195	$1,081	$3,465	$2,384.00	3.21
BW-P5	$19,405	$1,714	$694	($1,019.85)	0.40
BW-P6	$30,750	$2,732	$3,986	$1,254.00	1.46

TABLE 14 continued
EAST BATON ROUGE PARISH
Initial Economic Analysis
(1,000)

PLAN	FIRST COST	ANNUAL COST	INUNDATION REDUCTION BENEFITS	NET BENEFITS	B\C RATIO
BAYOU FOUNTAIN					
BF10	$2,457	$284	$298	$14.00	1.05
BF25	$5,358	$527	$541	$14.00	1.03
BF50	$6,632	$645	$634	($11.00)	0.98
BF25C	$26,448	$2,440	$693	($1,747.00)	0.28
BF50C	$31,456	$2,989	$700	($2,289.00)	0.23
BFPS 300	$9,684	$920	$214	($706.00)	0.23
BFPS 600	$17,431	$1,657	$214	($1,443.00)	0.13
BFPS 900	$29,052	$2,751	$214	($2,537.00)	0.08
BF GATE	$3,766	$381	$210	($171.00)	0.55
UBF 350A	$10,700	$1,034	$799	($235.00)	0.77
UBF 350B	$10,100	$978	$487	($491.00)	0.50
MEAD RL	$875	$118	$31	($87.00)	0.26
HLPK RL	$496	$67	$48	($19.00)	0.72
BUYOUT 10	$11,900	$1,094	$967	($127.00)	0.88
BUYOUT 25	$12,325	$1,133	$1,030	($103.00)	0.91
BF 10-BF GATE	$7,100	$750	$508	($242.00)	0.68
BFPS 300-C/S	$10,255	$1,006	$439	($567.00)	0.44
BFPS 300-BF10	$12,141	$1,204	$576	($628.00)	0.48
BFPS 600-BF10	$19,888	$1,941	$625	($1,316.00)	0.32
BFPS 600-BF25C	$26,577	$2,506	$849	($1,657.00)	0.34
BFPS 900-BF25C	$31,456	$2,989	$847	($2,142.00)	0.28
BFGATE-C/S	$4,297	$430	$439	$9.00	1.02

additional plans were developed. These were designated as WCC-P4A and WCC-P4B. Cost-benefit calculations for these reformulated plans are shown in Table 15. As with the initial plans these plans were also unjustified.

At this point of the analysis, plans were further reformulated by scaling down project size. Examination of flood reduction benefits and costs for incremental reaches in Plans WCC-P4A and B indicated the following:

> Paving the main stem of Ward Creek would not be cost effective; however clearing and snagging may be cost effective.
>
> Paving the lower reach of the North Branch Tributary (below I-12) would likely be cost effective while paving above I-12 would not be cost effective.
>
> Paving the lower half of Dawson Creek up to Kennilworth Parkway may be cost effective while paving above this point would not.

In consideration of the above, Plan WCC-P4B was eliminated and Plan WCC-P4A was further reformulated. Four plans (WCC-P4A1 thru P4A4) incorporating the above were developed. These are described in the main report.

Flood damage reduction benefits were calculated for the above 4 plans. In comparing these numbers to an estimate of incremental costs, it was clear that clearing and snagging all of the main stem of Ward Creek is cost effective and paving the lower half of Dawson is not. In addition to these findings, consideration was also given to the East Baton Rouge Parish Department of Public Works interest in paving North Branch to just above Old Hammond Highway where major paved drainage laterals feed this tributary.

Thus, two additional plans were developed and analyzed. Plan WCC-P4A5 consists of paving from the mouth to I-12 while WCC-P4A6 consists of this same plan with additional paving to just above Old Hammond Highway. Each plan included minimal clearing and snagging of all of the main stem of Ward Creek. A detailed cost and benefit analysis was conducted on these reformulated plans and the results are shown in Table 16. Plan WCC-P4A5 was the only plan that produced net benefits.

TABLE 15
EAST BATON ROUGE PARISH
Intermediate Economic Analysis - Ward Creek
(1,000)

PLAN	FIRST COST	ANNUAL COST	INUNDATION REDUCTION BENEFITS	NET BENEFITS	B\C RATIO
WARD CREEK					
WCC-P4A	$66,100	$6,106	$2,294	($3,812.00)	0.38
WCC-P4B	$68,000	$6,280	$2,472	($3,808.00)	0.39

TABLE 16
EAST BATON ROUGE PARISH
Final Economic Analysis
(1,000)

PLAN	FIRST COST	ANNUAL COST	INUNDATION REDUCTION BENEFITS	NET BENEFITS	B\C RATIO
WARD CREEK					
WCC-P4A5	$9,434	$932	$1,032.00	$100.00	1.11
WCC-P4A6	$17,785	$1,704	$1,214.00	($490.00)	0.71

was conducted on these reformulated plans and the results are shown in Table 16. Plan WCC-P4A5 was the only plan that produced net benefits.

In the Bayou Fountain Watershed, the initial screening revealed that only four plans have a benefit to cost ratio greater than or near 1.0 to 1. They are: BF10, BF25, and BF50 (earthern channel improvements), and BFGATE-C/S (a flapgate with channel clearing and snagging).

At this point further qualitative screening was performed for each plan relative to each other. The channel modification plans have a relatively high degree of both performance and project cost certainty. These plans will significantly improve headwater flooding in the area where this problem frequently occurs. The flapgate plan will have very little impact on headwater flooding and it has a relatively high degree of cost uncertainty; thus, it was dropped from consideration. The 50-year earthen channel was also eliminated since it would not likely produce higher net economic benefits relative to the smaller plans. It was also determined that channel modification of the upstream reaches are only minimally effective, thus, the remaining channel plans were scaled back and reformulated eliminating upstream modifications above Ben Hur Road.

Four plans were developed and evaluated. Two plans consist of 10-year earthen channels with upstream limits at mile 54.3 or Ben Hur Road (BF10A and 10B). The other 2 plans are 25-year channels with upstream limits identical to the 10-year plans (BF25A and 25B). Benefits and costs for these plans are shown in Table 17. BF10B proved to be the NED plan.

In the other three watersheds, the plans with the greatest net benefits were carried forward into final analysis. These were JCCL-P1 for Jones Creek, BBN-P2 for Beaver Bayou, and BW-P2 for Blackwater Bayou. A description of these plans, as well as all of the other alternatives can be found in the main body of this report.

TABLE 17
EAST BATON ROUGE PARISH
Final Economic Analysis
(1,000)

PLAN	FIRST COST	ANNUAL COST	INUNDATION REDUCTION BENEFITS	NET BENEFITS	B\C RATIO
BAYOU FOUNTAIN					
BF10A	$3,836	$356	$415.55	$59.55	1.17
BF10B	$3,912	$362	$434.13	$72.13	1.20
BF25A	$7,371	$708	$479.33	($228.67)	0.68
BF25B	$8,796	$839	$492.05	($346.95)	0.59

Non-Structural Analysis. Due to the large number of structures in the Blackwater and Beaver Bayous that would be inundated by a 25-year or less frequent flood events, the raising of structures was analyzed. The SID program was used to identify and floodproof all residential and commercial properties in the 10 and 25-year flood plain. The EAD program was then used to calculate the average annual benefits by comparing the baseline with the 10-year uncontrolled Comite River Diversion to the floodproofing alternatives. The economic evaluation of the 10 and 25-year floodproofing alternatives for Blackwater and Beaver Bayous are shown below.

NONSTRUCTURAL ANALYSIS WITH COMITE RIVER DIVERSION IN PLACE
(in $1,000)

	Blackwater Bayou		Beaver Bayou	
	10-year	25-year	10-year	25-year
First Cost	11,500	13,750	21,770	26,000
Total Annual Cost	1,101	1,316	2,083	2,488
Total Annual Benefits	3,744	4,013	8,267	9,136
Net Benefits	2,643	2,697	6,184	6,648
B\C Ratio	3.4	3.0	4.0	3.7

SUMMARY OF NED BENEFITS. A summary of all benefits attributable to the NED plan for each watershed is presented in Tables 18A and 18B. Benefits are expressed as the average annual value of the present worth of all plan outputs measured at a specific point in time. For this study, that point is the end of the construction period, which was selected with regard to the point at which significant plan costs will be expended and significant benefits will be achieved.

BENEFIT-COST ANALYSIS. A summary of the benefit cost data for each NED plan in each watershed is shown in Tables 19A and 19B. This data is expressed in 1994 price levels and at the current Federal discount rate of 8%.

TABLE 18A

BENEFIT SUMMARY
(AVERAGE ANNUAL)

WITHOUT 10-YEAR UNCONTROLLED DIVERSION

BENEFIT CATEGORY	JONES CREEK JCCL-P1	WARD CREEK WCC-P4A5	BAYOU FOUNTAIN BF-10B	BEAVER BAYOU BBN-P2	BLACKWATER BAYOU BW-P2
INUNDATION REDUCTION	$7,954,510	$880,900	$504,780	$8,544,890	$3,956,120
FIA COSTS SAVED	$102,030	$18,090	$330	$19,965	$11,730
REDUCED EMERGENCY COST	$141,400	$31,700	$47,700	$61,000	$36,900
EROSION CONTROL	$362,700	$88,300	$0	$0	$0
FILL REDUCTION	$92,008	$1,530	$9,611	$189,901	$27,782
RECREATION	$577,000	$0	$0	$0	$0
BENS. DURING CONST.	$689,000	$64,000	$0	$0	$0
TOTAL AVG. ANNUAL BENEFIT	$9,918,648	$1,084,520	$562,421	$8,815,756	$4,032,532
TOTAL COSTS	$5,334,000	$924,000	$480,000	$2,034,000	$2,149,000
NET BENEFITS	$4,584,648	$160,520	$82,421	$6,781,756	$1,883,532

TABLE 18B

BENEFIT SUMMARY
(AVERAGE ANNUAL)

WITH 10-YEAR UNCONTROLLED DIVERSION

BENEFIT CATEGORY	JONES CREEK JCCL-P1	WARD CREEK WCC-P4A5	BAYOU FOUNTAIN BF-10B	BEAVER BAYOU BBN-P2	BLACKWATER BAYOU BW-P2
INUNDATION REDUCTION	$7,931,400	$880,900	$506,400	$8,521,900	$3,964,200
FIA COSTS SAVED	$102,150	$18,090	$270	$18,615	$8,355
REDUCED EMERGENCY COSTS	$140,600	$31,700	$41,000	$58,600	$34,200
EROSION CONTROL	$362,700	$88,300	$0	$0	$0
FILL REDUCTION	$96,046	$2,191	$9,835	$180,135	$30,676
RECREATION	$577,000	$0	$0	$0	$0
BENS. DURING CONST.	$689,000	$64,000	$0	$0	$0
TOTAL AVG. ANNUAL BENEFITS	$9,898,896	$1,085,181	$557,505	$8,779,250	$4,037,431
TOTAL COSTS	$5,334,000	$924,000	$480,000	$2,034,000	$2,149,000
NED BENEFITS	$4,564,896	$161,181	$77,505	$6,745,250	$1,888,431

TABLE 19A
BENEFITS/COSTS – NED PLANS
($1,000)
WITHOUT 10-YEAR UNCONTROLLED DIVERSION

	JONES CREEK JCCL-P1	WARD CREEK WCC-P4A5	BAYOU FOUNTAIN BF-10B	BEAVER BAYOU BBN-P2	BLACKWATER BAYOU BW-P2
FIRST COSTS					
CONSTRUCTION FEATURE	$52,590.00	$9,470.00	$4,760.00	$30,680.00	$29,430.00
GROSS INVESTMENT	$64,433.88	$10,370.51	$5,419.66	$24,104.18	$25,503.32
AVERAGE ANNUAL COSTS					
Interest/Amortization	$5,267.00	$848.00	$443.00	$1,970.00	$2,085.00
Operation/Maintenance	$67.00	$76.00	$37.00	$64.00	$64.00
TOTAL AVG ANNUAL COSTS	$5,334.00	$924.00	$480.00	$2,034.00	$2,149.00
AVERAGE ANNUAL BENEFITS					
Inundation Reduction	$7,954.51	$880.90	$504.78	$8,544.89	$3,956.12
FIA Costs Saved	$102.03	$18.09	$0.33	$19.97	$11.73
Reduced Emergency Costs	$141.40	$31.70	$47.70	$61.00	$36.90
Fill Reduction	$92.01	$1.53	$9.61	$189.90	$27.78
Recreation	$577.00	$0.00	$0.00	$0.00	$0.00
Erosion Control	$362.70	$88.30	$0.00	$0.00	$0.00
Benefits During Constr.	$689.00	$64.00	$0.00	$0.00	$0.00
TOTAL AVG ANNUAL BENEFITS	$9,918.65	$1,084.52	$562.42	$8,815.76	$4,032.53
BENEFIT/COST RATIO	1.86	1.17	1.17	4.33	1.88

TABLE 19B
BENEFITS/COSTS -- NED PLANS
($1,000)
WITH 10-YEAR UNCONTROLLED DIVERSION

	JONES CREEK JCCL-P1	WARD CREEK WCC-P4A5	BAYOU FOUNTAIN BF-10B	BEAVER BAYOU BBN-P2	BLACKWATER BAYOU BW-P2
FIRST COSTS					
CONSTRUCTION FEATURE	$52,590.00	$9,470.00	$4,760.00	$20,590.00	$21,690.00
GROSS INVESTMENT	$64,433.88	$10,370.51	$5,419.66	$24,104.18	$25,503.32
AVERAGE ANNUAL COSTS					
Interest/Amortization	$5,267.00	$848.00	$443.00	$1,970.00	$2,085.00
Operation/Maintenance	$67.00	$76.00	$37.00	$64.00	$64.00
TOTAL AVG ANNUAL COSTS	$5,334.00	$924.00	$480.00	$2,034.00	$2,149.00
AVERAGE ANNUAL BENEFITS					
Inundation Reduction	$7,931.40	$880.90	$506.40	$8,521.90	$3,964.20
FIA Costs Saved	$102.14	$18.09	$0.27	$18.61	$8.35
Reduced Emergency Costs	$140.60	$31.70	$41.00	$58.60	$34.20
Fill Reduction	$96.05	$2.19	$9.84	$180.14	$30.68
Recreation	$577.00	$0.00	$0.00	$0.00	$0.00
Erosion Control	$362.70	$88.30	$0.00	$0.00	$0.00
Benefits During Constr.	$689.00	$64.00	$0.00	$0.00	$0.00
TOTAL AVG ANNUAL BENEFITS	$9,898.89	$1,085.18	$557.51	$8,779.25	$4,037.43
BENEFIT/COST RATIO	1.86	1.17	1.16	4.32	1.88

FLOOD WITH 500-YEAR FREQUENCY. Guidelines indicate that specific analysis is required for the storm with a frequency of .002 (every 500 years). The with and without project damages for this single event are provided in Table 20A and 20B below.

VALUE OF STRUCTURES IN VARIOUS FLOODPLAINS. Tables 21A and 21B show the value of structures by floodplain for each watershed. This data is shown for existing conditions, as well as for the NED plan for each watershed with and without the Comite River Diversion in place.

COMPREHENSIVE BENEFIT COST ANALYSIS. Combining the total annual benefits and total annual costs into a comprehensive plan for the East Baton Rouge Parish Watershed amounts to $24,358,260 and $10,921,000, respectively. This yields a net benefit of over $13 million and a benefit cost ratio of 2.23.

TABLE 20A
FIVE HUNDRED YEAR FLOOD DAMAGES FOR EAST BATON ROUGE
(Structures And Contents In Thousands)
WITHOUT 10-YEAR UNCONTROLLED DIVERSION

BLACKWATER BAYOU WATERSHED

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN BW-P2	DAMAGE PREVENTED W NED PLAN
13	A	$2,638.9	$2,638.9	$0.0
	B	$2,475.9	$2,164.9	$311.0
	C	$1,961.4	$1,637.5	$323.9
	D	$685.4	$456.9	$228.5
	E	$1,470.1	$536.1	$934.0
	F	$9,952.0	$5,288.1	$4,663.9
	G	$2,062.1	$1,566.9	$495.2
	H	$156.6	$156.6	$0.0
	I	$22,903.7	$19,123.5	$3,780.2
TOTALS:		$44,306.1	$33,569.4	$10,736.7

BEAVER BAYOU WATERSHED

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN BBN-P2	DAMAGE PREVENTED W NED PLAN
14	A	$0.0	$0.0	$0.0
	B	$1,706.3	$1,706.3	$0.0
	C	$1,261.3	$1,220.4	$40.9
	D	$501.3	$27.4	$473.9
	E	$2,008.3	$591.6	$1,416.7
	F	$2,340.7	$31.0	$2,309.7
	G	$3,945.1	$2,498.8	$1,446.3
	H	$6,149.0	$3,655.9	$2,493.1
	I	$2,817.9	$940.3	$1,877.6
	J	$146.1	$9.7	$136.4
	K	$1,716.9	$1,578.6	$138.3
	L	$1,027.7	$430.5	$597.2
TOTALS:		$23,620.6	$12,690.5	$10,930.1

WARD'S CREEK WATERSHED

WARD'S CREEK

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN WCC-P4A5	DAMAGE PREVENTED W NED PLAN
21	B	$5,196.9	$4,294.3	$902.6
	C	$9,027.4	$7,936.0	$1,091.4
	D	$248.5	$248.5	$0.0
	E	$928.3	$928.3	$0.0
	F	$12,281.7	$12,281.7	$0.0
	G	$3,191.2	$3,191.2	$0.0
TOTALS:		$30,874.0	$28,880.0	$1,994.0

BAYOU DUPLANTIER

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN WCC-P4A5	DAMAGE PREVENTED W NED PLAN
25	A	$4,383.6	$4,193.5	$190.1

DAWSON CREEK

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN WCC-P4A5	DAMAGE PREVENTED W NED PLAN
26	A	$14,746.7	$14,746.7	$0.0

NORTH BRANCH-WARD'S CREEK

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN WCC-P4A5	DAMAGE PREVENTED W NED PLAN
27	A	$17,279.5	$297.1	$16,982.4
	B	$3,104.0	$3,104.0	$0.0
	C	$3,550.4	$3,208.8	$341.6
TOTALS:		$23,933.9	$6,609.9	$17,324.0

TABLE 20A continued

DAWSON CREEK

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN WCC-P4A5	DAMAGE PREVENTED W NED PLAN
30	A	$17,388.1	$16,255.9	$1,132.2

WARD'S CREEK

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN WCC-P4A5	DAMAGE PREVENTED W NED PLAN
32	A	$1,916.5	$1,916.5	$0.0
	B	$8,791.5	$8,791.5	$0.0
TOTALS:		$10,708.0	$10,708.0	$0.0

TOTAL WARD'S CREEK WATERSHED:		$102,034.3	$81,394.0	$20,640.3

JONES CREEK WATERSHED

JONES CREEK

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN JCCL-P1	DAMAGE PREVENTED W NED PLAN
22	A	$1,726.2	$1,626.8	$99.4
	B	$243.3	$148.8	$94.5
	C	$21,156.9	$732.4	$20,424.5
	D	$2,043.1	$3.6	$2,039.5
TOTALS:		$25,169.5	$2,511.6	$22,657.9

LIVELY BAYOU TRIBUTARY

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN JCCL-P1	DAMAGE PREVENTED W NED PLAN
23	O	$29,488.4	$4,554.6	$24,933.8
	P	$15,617.8	$284.6	$15,333.2
TOTALS:		$45,106.2	$4,839.2	$40,267.0

LIVELY BAYOU

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN JCCL-P1	DAMAGE PREVENTED W NED PLAN
24	L	$9,096.1	$355.9	$8,740.2
	M	$3,742.2	$238.5	$3,503.7
	N	$8,882.8	$3,234.9	$5,647.9
	N2	$2,213.6	$1,031.3	$1,182.3
TOTALS:		$23,934.7	$4,860.6	$19,074.1

WEINER CREEK

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN JCCL-P1	DAMAGE PREVENTED W NED PLAN
28	G	$497.6	$0.0	$497.6
	H	$88.7	$0.0	$88.7
	I	$1,109.1	$0.0	$1,109.1
TOTALS:		$1,695.4	$0.0	$1,695.4
TOTAL JONES CREEK WATERSHED:		$95,905.8	$12,211.4	$83,694.4

BAYOU FOUNTAIN WATERSHED

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN BF10B	DAMAGE PREVENTED W NED PLAN
29	A	$1,014.3	$987.7	$26.6
	B	$0.0	$0.0	$0.0
	C	$521.5	$521.5	$0.0
	D	$12,680.5	$7,205.2	$5,475.3
	D1	$840.5	$766.7	$73.8
	D2	$1,942.5	$1,464.8	$477.7
	E	$295.8	$295.8	$0.0
	G	$11,963.0	$11,963.0	$0.0
	H	$558.5	$558.5	$0.0
	I	$8,158.4	$8,158.4	$0.0
	I2	$9,012.4	$9,012.4	$0.0
	K	$478.9	$478.9	$0.0
	L	$7,660.5	$7,660.5	$0.0
	M	$3,780.6	$3,780.6	$0.0
TOTALS:		$58,907.4	$52,854.0	$6,053.4
TOTAL ALL BASINS:		$324,774.2	$192,719.3	$132,054.9

TABLE 20B
FIVE HUNDRED YEAR FLOOD DAMAGES FOR EAST BATON ROUGE
(Structures And Contents In Thousands)
WITH 10-YEAR UNCONTROLLED COMITE RIVER DIVERSION IN PLACE

BLACKWATER BAYOU WATERSHED

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN BW-P2	DAMAGE PREVENTED W NED PLAN
13	A	$2,208.7	$2,208.7	$0.0
	B	$2,475.9	$2,131.7	$344.2
	C	$1,961.4	$1,637.5	$323.9
	D	$685.4	$456.9	$228.5
	E	$1,470.1	$536.1	$934.0
	F	$9,952.0	$5,288.1	$4,663.9
	G	$2,062.1	$1,566.9	$495.2
	H	$156.6	$156.6	$0.0
	I	$20,624.3	$14,346.8	$6,277.5
TOTALS:		$41,596.5	$28,329.3	$13,267.2

BEAVER BAYOU WATERSHED

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN BBN-P2	DAMAGE PREVENTED W NED PLAN
14	A	$0.0	$0.0	$0.0
	B	$1,015.5	$1,015.5	$0.0
	C	$803.4	$803.4	$0.0
	D	$316.8	$11.1	$305.7
	E	$2,008.3	$591.6	$1,416.7
	F	$2,340.7	$31.0	$2,309.7
	G	$3,945.1	$2,498.8	$1,446.3
	H	$6,149.0	$3,655.9	$2,493.1
	I	$2,817.9	$940.3	$1,877.6
	J	$146.1	$9.7	$136.4
	K	$1,716.9	$1,578.6	$138.3
	L	$1,027.7	$430.5	$597.2
TOTALS:		$22,287.4	$11,566.4	$10,721.0

TABLE 20B continued

WARD'S CREEK WATERSHED

WARD'S CREEK

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN WCC-P4A5	DAMAGE PREVENTED W NED PLAN
21	B	$5,196.9	$4,294.3	$902.6
	C	$9,027.4	$7,936.0	$1,091.4
	D	$248.5	$248.5	$0.0
	E	$928.3	$928.3	$0.0
	F	$12,281.7	$12,281.7	$0.0
	G	$3,191.2	$3,191.2	$0.0
TOTALS:		$30,874.0	$28,880.0	$1,994.0

BAYOU DUPLANTIER

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN WCC-P4A5	DAMAGE PREVENTED W NED PLAN
25	A	$4,383.6	$4,193.5	$190.1

DAWSON CREEK

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN WCC-P4A5	DAMAGE PREVENTED W NED PLAN
26	A	$14,746.7	$14,746.7	$0.0

NORTH BRANCH-WARD'S CREEK

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN WCC-P4A5	DAMAGE PREVENTED W NED PLAN
27	A	$17,279.5	$297.1	$16,982.4
	B	$3,104.0	$3,104.0	$0.0
	C	$3,550.4	$3,208.8	$341.6
TOTALS:		$23,933.9	$6,609.9	$17,324.0

TABLE 20B continued

DAWSON CREEK

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN WCC-P4A5	DAMAGE PREVENTED W NED PLAN
30	A	$17,388.1	$16,255.9	$1,132.2

WARD'S CREEK

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN WCC-P4A5	DAMAGE PREVENTED W NED PLAN
32	A	$1,916.5	$1,916.5	$0.0
	B	$8,791.5	$8,559.4	$232.1
TOTALS:		$10,708.0	$10,475.9	$232.1

TOTAL WARD'S CREEK WATERSHED:	$102,034.3	$81,161.9	$20,872.4

JONES CREEK WATERSHED

JONES CREEK

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN JCCL-P1	DAMAGE PREVENTED W NED PLAN
22	A	$1,026.3	$883.0	$143.3
	B	$218.4	$113.1	$105.3
	C	$21,156.9	$350.7	$20,806.2
	D	$2,043.1	$3.6	$2,039.5
TOTALS:		$24,444.7	$1,350.4	$23,094.3

LIVELY BAYOU TRIBUTARY

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN JCCL-P1	DAMAGE PREVENTED W NED PLAN
23	O	$29,488.4	$4,554.6	$24,933.8
	P	$15,617.8	$284.6	$15,333.2
TOTALS:		$45,106.2	$4,839.2	$40,267.0

TABLE 20B continued

LIVELY BAYOU

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN JCCL-P1	DAMAGE PREVENTED W NED PLAN
24	L	$9,096.1	$355.9	$8,740.2
	M	$3,742.2	$238.5	$3,503.7
	N	$8,882.8	$3,234.9	$5,647.9
	N2	$2,213.6	$1,031.3	$1,182.3
TOTALS:		$23,934.7	$4,860.6	$19,074.1

WEINER CREEK

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN JCCL-P1	DAMAGE PREVENTED W NED PLAN
28	G	$497.6	$0.0	$497.6
	H	$88.7	$0.0	$88.7
	I	$1,109.1	$0.0	$1,109.1
TOTALS:		$1,695.4	$0.0	$1,695.4

TOTAL JONES CREEK WATERSHED:		$95,181.0	$11,050.2	$84,130.8

BAYOU FOUNTAIN WATERSHED

BASIN NUMBER	REACH	WITHOUT PROJECT	NED PLAN BF10B	DAMAGE PREVENTED W NED PLAN
29	A	$1,014.3	$976.5	$37.8
	B	$0.0	$0.0	$0.0
	C	$521.5	$521.5	$0.0
	D	$12,680.5	$6,566.9	$6,113.6
	D1	$861.5	$766.7	$94.8
	D2	$2,189.7	$1,336.8	$852.9
	E	$295.8	$295.8	$0.0
	G	$11,963.0	$11,963.0	$0.0
	H	$558.5	$558.5	$0.0
	I	$8,158.4	$8,158.4	$0.0
	I2	$9,012.4	$9,012.4	$0.0
	K	$478.9	$478.9	$0.0
	L	$7,660.5	$7,660.5	$0.0
	M	$3,780.6	$3,780.6	$0.0
TOTALS:		$59,175.6	$52,076.5	$7,099.1
TOTAL ALL BASINS:		$320,274.8	$184,184.3	$136,090.5

TABLE 21A
VALUE OF STRUCTURES IN THE VARIOUS
FLOODPLAINS OF EAST BATON ROUGE
WITH AND WITHOUT PROJECT

NOTE: FLOOD ZONES THE SAME FOR ALL EXCEPT BAYOU FOUNTAIN

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 50 YEAR	ALL FLOOD ZONES
	BLACKWATER BAYOU WATERSHED							
	BASIN NAME: BLACKWATER BAYOU							
	WITHOUT PROJECT							
13	1-STORY	$14,066	$4,153	$19,079	$9,799	$3,530	$6,055	$56,682
	2-STORY	$1,858	$177	$513	$502	$143	$347	$3,540
	MOBILE HOME	$41	$51	$226	$97	$223	$1,081	$1,719
	COMMERCIAL	$3,385	$158	$1,501	$3,270	$466	$484	$9,264
	TOTAL	$19,350	$4,539	$21,319	$13,668	$4,362	$7,967	$71,205
	WITH PROJECT: BW-P2 NED PLAN							
	1-STORY	$6,907	$1,416	$13,268	$12,691	$13,431	$8,969	$56,682
	2-STORY	$1,070	$109	$972	$317	$554	$518	$3,540
	MOBILE HOME	$11	$0	$162	$148	$168	$1,230	$1,719
	COMMERCIAL	$26	$95	$4,063	$558	$3,630	$892	$9,264
	TOTAL	$8,014	$1,620	$18,465	$13,714	$17,783	$11,609	$71,205

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 50 YEAR	ALL FLOOD ZONES
	BEAVER BAYOU WATERSHED							
	BASIN NAME: BEAVER BAYOU							
	WITHOUT PROJECT							
14	1-STORY	$17,827	$4,240	$2,283	$5,801	$3,718	$36,069	$69,938
	2-STORY	$907	$111	$52	$316	$260	$1,903	$3,549
	MOBILE HOME	$195	$124	$87	$112	$148	$2,345	$3,011
	COMMERCIAL	$13,773	$184	$214	$2,282	$110	$33,004	$49,567
	TOTAL	$32,702	$4,659	$2,636	$8,511	$4,236	$73,321	$126,065
	WITH PROJECT: BBN-P2 NED PLAN							
	1-STORY	$5,027	$2,279	$3,460	$2,796	$10,056	$46,320	$69,938
	2-STORY	$262	$80	$52	$136	$304	$2,715	$3,549
	MOBILE HOME	$44	$22	$20	$16	$103	$2,806	$3,011
	COMMERCIAL	$1,058	$196	$85	$602	$363	$47,263	$49,567
	TOTAL	$6,391	$2,577	$3,617	$3,550	$10,826	$99,104	$126,065

TABLE 21A continued

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 50 YEAR	ALL FLOOD ZONES
	WARD'S CREEK WATERSHED							
	BASIN NAME: WARD'S CREEK							
	WITHOUT PROJECT							
21	1-STORY	$1,565	$6,748	$5,675	$5,525	$12,096	$36,932	$68,541
	2-STORY	$112	$0	$416	$50	$88	$1,372	$2,038
	MOBILE HOME	$0	$0	$0	$0	$0	$11	$11
	COMMERCIAL	$255	$2,445	$3,222	$10,289	$16,881	$43,417	$76,509
	TOTAL	$1,932	$9,193	$9,313	$15,864	$29,065	$81,732	$147,099
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	$57	$1,856	$6,543	$9,144	$13,871	$37,070	$68,541
	2-STORY	$112	$0	$62	$404	$88	$1,372	$2,038
	MOBILE HOME	$0	$0	$0	$0	$11	$0	$11
	COMMERCIAL	$108	$382	$3,987	$4,690	$23,926	$43,416	$76,509
	TOTAL	$277	$2,238	$10,592	$14,238	$37,896	$81,858	$147,099
	BASIN NAME: BAYOU DUPLANTIER							
	WITHOUT PROJECT							
25	1-STORY	$264	$1,144	$43	$1,873	$650	$4,972	$8,946
	2-STORY	$151	$279	$259	$418	$343	$1,805	$3,255
	MOBILE HOME	$0	$0	$0	$0	$0	$0	$0
	COMMERCIAL	$2,836	$855	$2,176	$1,013	$3,403	$7,706	$17,989
	TOTAL	$3,251	$2,278	$2,478	$3,304	$4,396	$14,483	$30,190
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	$176	$1,232	$43	$879	$1,644	$4,972	$8,946
	2-STORY	$52	$279	$358	$120	$641	$1,805	$3,255
	MOBILE HOME	$0	$0	$0	$0	$0	$0	$0
	COMMERCIAL	$2,836	$855	$2,176	$827	$3,571	$7,724	$17,989
	TOTAL	$3,064	$2,366	$2,577	$1,826	$5,856	$14,501	$30,190
	BASIN NAME: DAWSON CREEK							
	WITHOUT PROJECT							
26	1-STORY	$4,815	$3,631	$1,219	$501	$1,290	$4,503	$15,959
	2-STORY	$1,048	$542	$299	$88	$81	$849	$2,907
	MOBILE HOME	$0	$0	$0	$0	$0	$0	$0
	COMMERCIAL	$3,882	$8,266	$3,474	$2,743	$2,977	$10,432	$31,774
	TOTAL	$9,745	$12,439	$4,992	$3,332	$4,348	$15,784	$50,640
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	$4,815	$3,631	$1,219	$501	$1,290	$4,503	$15,959
	2-STORY	$1,048	$542	$299	$88	$81	$849	$2,907
	MOBILE HOME	$0	$0	$0	$0	$0	$0	$0
	COMMERCIAL	$3,882	$8,266	$3,474	$2,743	$2,977	$10,432	$31,774
	TOTAL	$9,745	$12,439	$4,992	$3,332	$4,348	$15,784	$50,640

TABLE 21A continued

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 50 YEAR	ALL FLOOD ZONES
	WARD'S CREEK WATERSHED continued							
	BASIN NAME: NORTH BRANCH-WARD'S CREEK							
	WITHOUT PROJECT							
27	1-STORY	$1,401	$7,342	$2,668	$10,479	$15,997	$26,836	$64,723
	2-STORY	$243	$2,409	$95	$2,043	$7,869	$3,937	$16,596
	MOBILE HOME	$0	$0	$0	$0	$0	$0	$0
	COMMERCIAL	$4,515	$7,081	$2,442	$1,091	$5,665	$39,458	$60,252
	TOTAL	$6,159	$16,832	$5,205	$13,613	$29,531	$70,231	$141,571
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	$141	$1,620	$773	$276	$2,733	$59,180	$64,723
	2-STORY	$91	$1,211	$95	$1,207	$797	$13,195	$16,596
	MOBILE HOME	$0	$0	$0	$0	$0	$0	$0
	COMMERCIAL	$3,729	$6,756	$2,857	$349	$1,344	$45,217	$60,252
	TOTAL	$3,961	$9,587	$3,725	$1,832	$4,874	$117,592	$141,571
	BASIN NAME: DAWSON CREEK							
	WITHOUT PROJECT							
30	1-STORY	$1,118	$3,709	$629	$972	$6,515	$5,202	$18,145
	2-STORY	$0	$160	$216	$2,088	$3,456	$4,180	$10,100
	MOBILE HOME	$0	$0	$0	$0	$0	$0	$0
	COMMERCIAL	$12,077	$9,246	$545	$666	$1,605	$11,204	$35,343
	TOTAL	$13,195	$13,115	$1,390	$3,726	$11,576	$20,586	$63,588
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	$1,118	$3,709	$155	$1,250	$6,295	$5,618	$18,145
	2-STORY	$0	$160	$0	$1,756	$3,952	$4,232	$10,100
	MOBILE HOME	$0	$0	$0	$0	$0	$0	$0
	COMMERCIAL	$11,858	$9,465	$172	$905	$1,739	$11,204	$35,343
	TOTAL	$12,976	$13,334	$327	$3,911	$11,986	$21,054	$63,588
	BASIN NAME: WARD'S CREEK							
	WITHOUT PROJECT							
32	1-STORY	$1,003	$426	$2,573	$1,429	$3,606	$6,772	$15,809
	2-STORY	$319	$172	$326	$261	$163	$1,356	$2,597
	MOBILE HOME	$46	$0	$0	$0	$11	$841	$898
	COMMERCIAL	$3,201	$171	$2,594	$974	$771	$598	$8,309
	TOTAL	$4,569	$769	$5,493	$2,664	$4,551	$9,567	$27,613
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	$1,003	$426	$2,573	$1,429	$3,606	$6,772	$15,809
	2-STORY	$319	$172	$326	$261	$163	$1,356	$2,597
	MOBILE HOME	$46	$0	$0	$0	$11	$841	$898
	COMMERCIAL	$3,201	$171	$2,594	$974	$771	$598	$8,309
	TOTAL	$4,569	$769	$5,493	$2,664	$4,551	$9,567	$27,613

TABLE 21A continued

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 50 YEAR	ALL FLOOD ZONES
	JONES CREEK WATERSHED							
	BASIN NAME: JONES CREEK							
	WITHOUT PROJECT							
22	1-STORY	$4,525	$2,249	$10,002	$6,899	$11,689	$81,442	$116,806
	2-STORY	$626	$527	$2,312	$1,300	$3,848	$20,739	$29,352
	MOBILE HOME	$8	$10	$22	$0	$11	$48	$99
	COMMERCIAL	$5,413	$2,849	$6,108	$4,174	$2,435	$32,414	$53,393
	TOTAL	$10,572	$5,635	$18,444	$12,373	$17,983	$134,643	$199,650
	WITH PROJECT: JCCL-P1 NED PLAN							
	1-STORY	$120	$120	$360	$379	$4,828	$110,999	$116,806
	2-STORY	$0	$0	$0	$21	$1,768	$27,563	$29,352
	MOBILE HOME	$0	$0	$11	$0	$11	$77	$99
	COMMERCIAL	$104	$0	$8	$0	$3,739	$49,542	$53,393
	TOTAL	$224	$120	$379	$400	$10,346	$188,181	$199,650
	BASIN NAME: LIVELY BAYOU TRIBUTARY							
	WITHOUT PROJECT							
23	1-STORY	$34,896	$9,566	$8,362	$3,442	$5,018	$5,566	$66,850
	2-STORY	$1,626	$889	$375	$284	$488	$1,175	$4,837
	MOBILE HOME	$0	$0	$0	$0	$0	$0	$0
	COMMERCIAL	$763	$1,850	$0	$0	$0	$0	$2,613
	TOTAL	$37,285	$12,305	$8,737	$3,726	$5,506	$6,741	$74,300
	WITH PROJECT: JCCL-P1 NED PLAN							
	1-STORY	$0	$0	$0	$525	$13,224	$53,101	$66,850
	2-STORY	$0	$0	$0	$84	$1,344	$3,409	$4,837
	MOBILE HOME	$0	$0	$0	$0	$0	$0	$0
	COMMERCIAL	$0	$0	$0	$0	$0	$2,613	$2,613
	TOTAL	$0	$0	$0	$609	$14,568	$59,123	$74,300
	BASIN NAME: LIVELY BAYOU							
	WITHOUT PROJECT							
24	1-STORY	$6,470	$3,919	$4,207	$1,141	$5,270	$6,275	$27,282
	2-STORY	$1,501	$4,752	$630	$0	$527	$2,520	$9,930
	MOBILE HOME	$0	$0	$11	$0	$107	$298	$416
	COMMERCIAL	$6,006	$1,208	$8,167	$65	$1,264	$142	$16,852
	TOTAL	$13,977	$9,879	$13,015	$1,206	$7,168	$9,235	$54,480
	WITH PROJECT: JCCL-P1 NED PLAN							
	1-STORY	$0	$0	$1,054	$119	$5,623	$20,486	$27,282
	2-STORY	$0	$0	$0	$0	$1,571	$8,359	$9,930
	MOBILE HOME	$0	$0	$0	$0	$0	$416	$416
	COMMERCIAL	$0	$0	$0	$0	$10,275	$6,577	$16,852
	TOTAL	$0	$0	$1,054	$119	$17,469	$35,838	$54,480

TABLE 21A continued

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 50 YEAR	ALL FLOOD ZONES
	JONES CREEK WATERSHED continued							
	BASIN NAME: WEINER CREEK							
	WITHOUT PROJECT							
28	1-STORY	$352	$0	$804	$0	$2,326	$35,773	$39,255
	2-STORY	$0	$0	$0	$200	$434	$6,941	$7,575
	MOBILE HOME	$0	$0	$0	$0	$0	$10	$10
	COMMERCIAL	$0	$0	$139	$0	$0	$3,569	$3,708
	TOTAL	$352	$0	$943	$200	$2,760	$46,293	$50,548
	WITH PROJECT: JCCL-P1 NED PLAN							
	1-STORY	$0	$0	$0	$0	$0	$39,255	$39,255
	2-STORY	$0	$0	$0	$0	$0	$7,575	$7,575
	MOBILE HOME	$0	$0	$0	$0	$0	$10	$10
	COMMERCIAL	$0	$0	$0	$0	$0	$3,708	$3,708
	TOTAL	$0	$0	$0	$0	$0	$50,548	$50,548

BASIN NO.	STRUCTURE CATEGORY	0-5 YEAR	5-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 50 YEAR	ALL FLOOD ZONES
	BAYOU FOUNTAIN WATERSHED							
	BASIN NAME: BAYOU FOUNTAIN *							
	WITHOUT PROJECT							
29	1-STORY	$1,950	$7,324	$986	$617	$22,452	$25,220	$58,548
	2-STORY	$1,180	$3,422	$8,111	$265	$14,461	$10,685	$38,124
	MOBILE HOME	$0	$0	$0	$0	$0	$72	$72
	APT. BLDGS.	$3,332	$18,570	$14,231	$963	$5,183	$7,062	$49,341
	COMMERCIAL	$1,380	$9,077	$1,529	$36,383	$70,249	$14,217	$132,835
	TOTAL	$7,841	$38,393	$24,857	$38,229	$112,345	$57,256	$278,920
	WITH PROJECT: BF10B NED PLAN							
	1-STORY	$1,365	$1,691	$1,661	$6,087	$19,761	$27,984	$58,548
	2-STORY	$80	$1,514	$0	$11,119	$7,909	$17,502	$38,124
	MOBILE HOME	$0	$0	$0	$0	$0	$72	$72
	APT. BLDGS.	$3,108	$18,794	$8,253	$6,643	$5,482	$7,062	$49,341
	COMMERCIAL	$880	$4,187	$1,767	$40,756	$68,844	$16,402	$132,835
	TOTAL	$5,432	$26,186	$11,680	$64,605	$101,996	$69,022	$278,920

* Note: The First Two Flood Zones Are Different For Basin 29. It Was Analyzed With Greater Precision In Order To Achieve More Accuracy In This Area. An Additional Damage Category Was Incorporated Into The Analysis.

TABLE 21B
VALUE OF STRUCTURES IN THE VARIOUS
FLOODPLAINS OF EAST BATON ROUGE
WITH AND WITHOUT PROJECT
WITH 10 YEAR UNCONTROLLED COMITE RIVER DIVERSION IN PLACE
NOTE: FLOOD ZONES THE SAME FOR ALL EXCEPT BAYOU FOUNTAIN

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 50 YEAR	ALL FLOO ZONES
	BLACKWATER BAYOU WATERSHED							
	BASIN NAME: BLACKWATER BAYOU							
	WITHOUT PROJECT							
13	1-STORY	$11,544	$1,929	$16,803	$12,685	$7,463	$6,258	$56,682
	2-STORY	$1,422	$140	$768	$720	$143	$347	$3,540
	MOBILE HOME	$41	$40	$214	$109	$157	$1,158	$1,719
	COMMERCIAL	$3,385	$137	$1,232	$394	$3,439	$677	$9,264
	TOTAL	$16,392	$2,246	$19,017	$13,908	$11,202	$8,440	$71,205
	WITH PROJECT: BW-P2 NED PLAN							
	1-STORY	$4,385	$533	$11,545	$10,809	$16,049	$13,361	$56,682
	2-STORY	$634	$0	$1,241	$593	$507	$565	$3,540
	MOBILE HOME	$11	$0	$140	$117	$125	$1,326	$1,719
	COMMERCIAL	$26	$95	$3,763	$568	$531	$4,281	$9,264
	TOTAL	$5,056	$628	$16,689	$12,087	$17,212	$19,533	$71,205

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 50 YEAR	ALL FLOO ZONES
	BEAVER BAYOU WATERSHED							
	BASIN NAME: BEAVER BAYOU							
	WITHOUT PROJECT							
14	1-STORY	$17,602	$4,309	$895	$5,287	$3,904	$37,941	$69,938
	2-STORY	$907	$111	$52	$100	$476	$1,903	$3,549
	MOBILE HOME	$195	$103	$65	$112	$171	$2,365	$3,011
	COMMERCIAL	$13,764	$131	$155	$2,169	$234	$33,114	$49,567
	TOTAL	$32,468	$4,654	$1,167	$7,668	$4,785	$75,323	$126,065
	WITH PROJECT: BBN-P2 NED PLAN							
	1-STORY	$5,027	$2,239	$2,118	$2,637	$9,789	$48,128	$69,938
	2-STORY	$262	$80	$52	$136	$304	$2,715	$3,549
	MOBILE HOME	$44	$1	$31	$16	$93	$2,826	$3,011
	COMMERCIAL	$1,058	$156	$125	$602	$363	$47,263	$49,567
	TOTAL	$6,391	$2,476	$2,326	$3,391	$10,549	$100,932	$126,065

TABLE 21B continued

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 50 YEAR	ALL FLOO ZONES
	WARD'S CREEK WATERSHED							
	BASIN NAME: WARD'S CREEK							
	WITHOUT PROJECT							
21	1-STORY	$1,565	$6,748	$5,675	$5,525	$12,096	$36,932	$68,541
	2-STORY	$112	$0	$416	$50	$88	$1,372	$2,038
	MOBILE HOME	$0	$0	$0	$0	$0	$11	$11
	COMMERCIAL	$255	$2,445	$3,222	$10,289	$16,881	$43,417	$76,509
	TOTAL	$1,932	$9,193	$9,313	$15,864	$29,065	$81,732	$147,099
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	$57	$1,856	$6,543	$9,144	$13,871	$37,070	$68,541
	2-STORY	$112	$0	$62	$404	$88	$1,372	$2,038
	MOBILE HOME	$0	$0	$0	$0	$11	$0	$11
	COMMERCIAL	$108	$382	$3,987	$4,690	$23,926	$43,416	$76,509
	TOTAL	$277	$2,238	$10,592	$14,238	$37,896	$81,858	$147,099
	BASIN NAME: BAYOU DUPLANTIER							
	WITHOUT PROJECT							
25	1-STORY	$264	$1,144	$43	$1,873	$650	$4,972	$8,946
	2-STORY	$151	$279	$259	$418	$343	$1,805	$3,255
	MOBILE HOME	$0	$0	$0	$0	$0	$0	$0
	COMMERCIAL	$2,836	$855	$2,176	$1,013	$3,403	$7,706	$17,989
	TOTAL	$3,251	$2,278	$2,478	$3,304	$4,396	$14,483	$30,190
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	$176	$1,232	$43	$879	$1,644	$4,972	$8,946
	2-STORY	$52	$279	$358	$120	$641	$1,805	$3,255
	MOBILE HOME	$0	$0	$0	$0	$0	$0	$0
	COMMERCIAL	$2,836	$855	$2,176	$827	$3,571	$7,724	$17,989
	TOTAL	$3,064	$2,366	$2,577	$1,826	$5,856	$14,501	$30,190
	BASIN NAME: DAWSON CREEK							
	WITHOUT PROJECT							
26	1-STORY	$4,815	$3,631	$1,219	$501	$1,290	$4,503	$15,959
	2-STORY	$1,048	$542	$299	$88	$81	$849	$2,907
	MOBILE HOME	$0	$0	$0	$0	$0	$0	$0
	COMMERCIAL	$3,882	$8,266	$3,474	$2,743	$2,977	$10,432	$31,774
	TOTAL	$9,745	$12,439	$4,992	$3,332	$4,348	$15,784	$50,640
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	$4,815	$3,631	$1,219	$501	$1,290	$4,503	$15,959
	2-STORY	$1,048	$542	$299	$88	$81	$849	$2,907
	MOBILE HOME	$0	$0	$0	$0	$0	$0	$0
	COMMERCIAL	$3,882	$8,266	$3,474	$2,743	$2,977	$10,432	$31,774
	TOTAL	$9,745	$12,439	$4,992	$3,332	$4,348	$15,784	$50,640

TABLE 21B continued

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 50 YEAR	ALL FLOO ZONES
	WARD'S CREEK WATERSHED continued							
	BASIN NAME: NORTH BRANCH-WARD'S CREEK							
	WITHOUT PROJECT							
27	1-STORY	$1,401	$7,342	$2,668	$10,479	$15,997	$26,836	$64,723
	2-STORY	$243	$2,409	$95	$2,043	$7,869	$3,937	$16,596
	MOBILE HOME	$0	$0	$0	$0	$0	$0	$0
	COMMERCIAL	$4,515	$7,081	$2,442	$1,091	$5,665	$39,458	$60,252
	TOTAL	$6,159	$16,832	$5,205	$13,613	$29,531	$70,231	$141,571
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	$141	$1,620	$773	$276	$2,733	$59,180	$64,723
	2-STORY	$91	$1,211	$95	$1,207	$797	$13,195	$16,596
	MOBILE HOME	$0	$0	$0	$0	$0	$0	$0
	COMMERCIAL	$3,729	$6,756	$2,857	$349	$1,344	$45,217	$60,252
	TOTAL	$3,961	$9,587	$3,725	$1,832	$4,874	$117,592	$141,571
	BASIN NAME: DAWSON CREEK							
	WITHOUT PROJECT							
30	1-STORY	$1,118	$3,709	$629	$972	$6,515	$5,202	$18,145
	2-STORY	$0	$160	$216	$2,088	$3,456	$4,180	$10,100
	MOBILE HOME	$0	$0	$0	$0	$0	$0	$0
	COMMERCIAL	$12,077	$9,246	$545	$666	$1,605	$11,204	$35,343
	TOTAL	$13,195	$13,115	$1,390	$3,726	$11,576	$20,586	$63,588
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	$1,118	$3,709	$155	$1,250	$6,295	$5,618	$18,145
	2-STORY	$0	$160	$0	$1,756	$3,952	$4,232	$10,100
	MOBILE HOME	$0	$0	$0	$0	$0	$0	$0
	COMMERCIAL	$11,858	$9,465	$172	$905	$1,739	$11,204	$35,343
	TOTAL	$12,976	$13,334	$327	$3,911	$11,986	$21,054	$63,588
	BASIN NAME: WARD'S CREEK							
	WITHOUT PROJECT							
32	1-STORY	$1,003	$426	$2,573	$1,429	$3,606	$6,772	$15,809
	2-STORY	$319	$172	$326	$261	$163	$1,356	$2,597
	MOBILE HOME	$46	$0	$0	$0	$11	$841	$898
	COMMERCIAL	$3,188	$184	$2,594	$974	$771	$598	$8,309
	TOTAL	$4,556	$782	$5,493	$2,664	$4,551	$9,567	$27,613
	WITH PROJECT: WCC-P4A5 NED PLAN							
	1-STORY	$1,003	$426	$2,573	$1,429	$3,606	$6,772	$15,809
	2-STORY	$319	$172	$326	$261	$163	$1,356	$2,597
	MOBILE HOME	$46	$0	$0	$0	$11	$841	$898
	COMMERCIAL	$3,188	$184	$2,594	$24	$1,721	$598	$8,309
	TOTAL	$4,556	$782	$5,493	$1,714	$5,501	$9,567	$27,613

TABLE 21B continued

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 50 YEAR	ALL FLOO ZONES
	JONES CREEK WATERSHED							
	BASIN NAME: JONES CREEK							
	WITHOUT PROJECT							
22	1-STORY	$4,525	$2,249	$7,261	$8,553	$12,369	$81,849	$116,806
	2-STORY	$626	$527	$1,839	$1,279	$3,940	$21,141	$29,352
	MOBILE HOME	$8	$10	$0	$22	$0	$59	$99
	COMMERCIAL	$5,413	$2,849	$6,108	$4,014	$2,533	$32,476	$53,393
	TOTAL	$10,572	$5,635	$15,208	$13,868	$18,842	$135,525	$199,650
	WITH PROJECT: JCCL-P1 NED PLAN							
	1-STORY	$0	$120	$120	$328	$2,240	$113,998	$116,806
	2-STORY	$0	$0	$0	$0	$1,114	$28,238	$29,352
	MOBILE HOME	$0	$0	$0	$11	$11	$77	$99
	COMMERCIAL	$104	$0	$8	$0	$1,413	$51,868	$53,393
	TOTAL	$104	$120	$128	$339	$4,778	$194,181	$199,650
	BASIN NAME: LIVELY BAYOU TRIBUTARY							
	WITHOUT PROJECT							
23	1-STORY	$34,896	$9,566	$8,362	$3,442	$5,018	$5,566	$66,850
	2-STORY	$1,626	$889	$375	$284	$488	$1,175	$4,837
	MOBILE HOME	$0	$0	$0	$0	$0	$0	$0
	COMMERCIAL	$763	$1,850	$0	$0	$0	$0	$2,613
	TOTAL	$37,285	$12,305	$8,737	$3,726	$5,506	$6,741	$74,300
	WITH PROJECT: JCCL-P1 NED PLAN							
	1-STORY	$0	$0	$0	$525	$13,224	$53,101	$66,850
	2-STORY	$0	$0	$0	$84	$1,344	$3,409	$4,837
	MOBILE HOME	$0	$0	$0	$0	$0	$0	$0
	COMMERCIAL	$0	$0	$0	$0	$0	$2,613	$2,613
	TOTAL	$0	$0	$0	$609	$14,568	$59,123	$74,300
	BASIN NAME: LIVELY BAYOU							
	WITHOUT PROJECT							
24	1-STORY	$6,470	$3,919	$4,207	$1,141	$5,270	$6,275	$27,282
	2-STORY	$1,501	$4,752	$630	$0	$527	$2,520	$9,930
	MOBILE HOME	$0	$0	$11	$0	$107	$298	$416
	COMMERCIAL	$6,006	$1,208	$8,167	$65	$1,264	$142	$16,852
	TOTAL	$13,977	$9,879	$13,015	$1,206	$7,168	$9,235	$54,480
	WITH PROJECT: JCCL-P1 NED PLAN							
	1-STORY	$0	$0	$1,054	$119	$5,623	$20,486	$27,282
	2-STORY	$0	$0	$0	$0	$1,571	$8,359	$9,930
	MOBILE HOME	$0	$0	$0	$0	$0	$416	$416
	COMMERCIAL	$0	$0	$0	$0	$10,275	$6,577	$16,852
	TOTAL	$0	$0	$1,054	$119	$17,469	$35,838	$54,480

TABLE 21B continued

BASIN NO.	STRUCTURE CATEGORY	0-10 YEAR	10-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 50 YEAR	ALL FLOO ZONES
	JONES CREEK WATERSHED continued							
	BASIN NAME: WEINER CREEK							
	WITHOUT PROJECT							
28	1-STORY	$352	$0	$804	$0	$2,326	$35,773	$39,255
	2-STORY	$0	$0	$0	$200	$434	$6,941	$7,575
	MOBILE HOME	$0	$0	$0	$0	$0	$10	$10
	COMMERCIAL	$0	$0	$139	$0	$0	$3,569	$3,708
	TOTAL	$352	$0	$943	$200	$2,760	$46,293	$50,548
	WITH PROJECT: JCCL-P1 NED PLAN							
	1-STORY	$0	$0	$0	$0	$0	$39,255	$39,255
	2-STORY	$0	$0	$0	$0	$0	$7,575	$7,575
	MOBILE HOME	$0	$0	$0	$0	$0	$10	$10
	COMMERCIAL	$0	$0	$0	$0	$0	$3,708	$3,708
	TOTAL	$0	$0	$0	$0	$0	$50,548	$50,548

BASIN NO.	STRUCTURE CATEGORY	0-5 YEAR	5-25 YEAR	25-50 YEAR	50-100 YEAR	100-500 YEAR	ABOVE 50 YEAR	ALL FLOO ZONES
	BAYOU FOUNTAIN WATERSHED							
	BASIN NAME: BAYOU FOUNTAIN *							
	WITHOUT PROJECT							
29	1-STORY	$1,950	$6,608	$1,648	$671	$22,452	$25,220	$58,549
	2-STORY	$1,180	$3,422	$8,011	$365	$14,461	$10,685	$38,124
	MOBILE HOME	$0	$0	$0	$0	$0	$72	$72
	APT. BLDGS.	$3,332	$18,570	$14,231	$963	$5,183	$7,062	$49,341
	COMMERCIAL	$1,380	$9,008	$1,598	$36,383	$70,249	$14,217	$132,835
	TOTAL	$7,842	$37,608	$25,488	$38,382	$112,345	$57,256	$278,921
	WITH PROJECT: BF10B NED PLAN							
	1-STORY	$1,365	$1,620	$1,033	$6,786	$19,697	$28,048	$58,549
	2-STORY	$80	$1,514	$0	$11,119	$7,909	$17,502	$38,124
	MOBILE HOME	$0	$0	$0	$0	$0	$72	$72
	APT. BLDGS.	$3,108	$18,794	$8,253	$6,643	$5,481	$7,062	$49,341
	COMMERCIAL	$880	$4,187	$1,299	$41,224	$68,844	$16,402	$132,835
	TOTAL	$5,432	$26,115	$10,585	$65,772	$101,931	$69,086	$278,921

* Note: The First Two Flood Zones Are Different For Basin 29. It Was Analyzed With Greater Precision In Order To Achieve More Accuracy In This Area. An Additional Damage Category Was Incorporated Into The Analysis.

RISK AND UNCERTAINTY ANALYSIS

GENERAL. The purpose of this risk and uncertainty analysis was to identify major project cost and benefit items and quantify the potential variances due to unknown or uncertain factors. Such variances were quantified on an individual basis and were integrated together with the base calculated single values to produce an overall range distribution of costs and benefits for each of the five watershed projects. This analysis was only done for the Tentatively Selected Plans and not in the plan formulation, screening, or selection process. An examination of final results did, however, confirm decisions made in the plan selection process.

METHODOLOGY. As stated above, individual major cost and benefit items were identified and a variance range distribution was estimated. These incremental range distributions were then integrated with the base calculated values for the costs and benefits of each project.

This process was accomplished by means of the @ RISK, Version 1.5, computer software by Palisade Corporation of Newfield, New York. This program runs a "Monte Carlo" random probability simulation which enables the mathematical combining of numeric distributions with each other and with single values.

In general, variance ranges were based either directly, or indirectly, on the professional judgement of the study team members. Ranges for structure and structure content values, and, for channel construction costs were based, however, on available statistical data. Since no statistical data were available on the probability distributions of most items, simple "triangle" probability distributions were used for all items with the exception of structure and structure contents values. A "uniform" probability distribution was used for these items since it was determined that there is an equally likely probability of any value within the ranges identified.

BLACKWATER BAYOU. Five items were identified as having potential major variance on the overall feasibility of the

project. These items and their estimated variance ranges are discussed below. The variance distribution for this watershed is displayed in Table 22. The minimum and maximum values provided in the table are based on output generated by the SID-EAD program. These results are shown graphically in Figures 1 through 4.

- Stage Frequency Values.

  Without project (existing) and with project floodstage frequency values directly affect existing and with project calculated damage dollar values. Variances on both existing and with project stages were determined to be within plus or minus 1.0 feet for all storm frequency events, for without project conditions and plus or minus 0.5 feet for with project conditions. See Engineering Appendix C. Damage values were recalculated incorporating this range. Applying the results, it is estimated that without project flood damages vary from minus \$2,773,000 to plus \$4,409,000 per year from the estimate. With project flood damages are estimated to vary from minus \$530,000 to plus \$497,000 per year from the single value estimate. Note that it was determined that there is likely to be some correlation between existing and with project stage frequency variance. A correlation factor of 0.5 was applied to this item in the "risk analysis" calculations described below.

- Structure Elevations.

  Variances in structure elevations directly affect both existing and with project calculated damage dollar values. Within practical limits, structure elevation variance was determined to be minus 0.5 to plus 0.5 feet. The calculated dollar value variance is minus \$589,000 to plus \$2,271,000 for existing annual damages, and, minus \$530,000 to plus \$479,000 for with project annual damages. Note that there is a direct correlation between existing and with project variances. A correlation factor of 1.0 was

therefore applied to this item in the "risk analysis" calculations described below.

- Structure Valuation.

  Variances in the estimate of structure values also affects both existing and with project calculated damage dollar value. Structure value variance range is estimated at plus or minus 10 percent from the single value estimate. Applying these results, it is estimated that existing flood damages vary from minus \$496,000 to plus \$431,000 per year. With project flood damages range from minus \$142,000 to plus \$125,000. A correlation factor of 1.0 was applied to with and without project variances.

- Construction Costs.

  Estimated variances in calculated quantities, unit prices, constructability, and other factors were considered in calculating the channel construction cost estimate. The calculated cost range is from minus \$6,500,000 to plus \$2,220,000 relative to the single value estimate used for this item. Converting this range to equivalent annual dollars yields minus \$650,000 to plus \$222,000 per year.

- Erosion Control Measures.

  As stated above, the extent that erosion control measures (geosynthetic mat and rock) is needed throughout the watershed is uncertain. For the purposes of this study, a worst case condition, i.e., the need for erosion control for the entire channel, was considered and used as the basis for the single value cost estimate for this item. Through field investigation it has been determined, however, that the need for erosion control may be significantly less extensive. The total channel length that may require erosion control measures could be less than 25 percent of the total. Since this item is discounted to a degree in the variance estimate of construction cost, it was determined that the

variance for this specific feature should be minus 50 percent to plus 5 percent from the single value cost estimate. In first cost this range is from minus \$5,000,000 to plus \$500,000. Conversion to equivalent annual dollars yields a range of minus \$500,000 to plus \$50,000 per year.

TABLE 22
VARIANCE DISTRIBUTIONS FOR BLACKWATER BAYOU

BASE VALUES: ($1,000/YEAR)

BENEFITS:	$4,037
COSTS:	$2,149

ITEM	VARIANCE DISTRIBUTION ($1,000/YEAR)
Existing Damages- ± 1 ft. Stage Frequency Values	Triangle Distribution Minimum: -$2,773 Most Likely: $0 Maximum: $4,409
Existing Damages- ± 0.5 ft. Structure Elevations	Triangle Distribution Minimum: -$ 589 Most Likely: $0 Maximum : $2,271
Existing Damages- Structure Value Range ± 10 %	Uniform Distribution Minimum: -$496 Maximum: $431
With Project Damages- ± 0.5 ft. Stage Frequency Values	Triangle Distribution Minimum: -$530 Most Likely: $0 Maximum: $479 (0.5 Correlation to Existing Stage Frequency)
With Project Damages- ± 0.5 ft. Structure Elevations	Triangle Distribution Minimum: -$530 Most Likely: $0 Maximum: $479 (1.0 Correlated to Existing Structure Elevations)

TABLE 22 (Continued)
VARIANCE DISTRIBUTIONS FOR BLACKWATER BAYOU

ITEM	VARIANCE DISTRIBUTION ($1,000/YEAR)
With Project Damages- Structure Value Range ± 10 %	Uniform Distribution Minimum: -$142 Maximum: $125 (1.0 Correlation to Existing Structure Values)
Project Costs- Channel Construction Costs	Triangle Distribution Minimum: -$650 Most Likely: $0 Maximum: $220
Project Costs- Erosion Control Costs	Triangle Distribution Minimum: -$500 Most Likely: $0 Maximum: $50

Figure 1
Blackwater Bayou
Probability Distribution

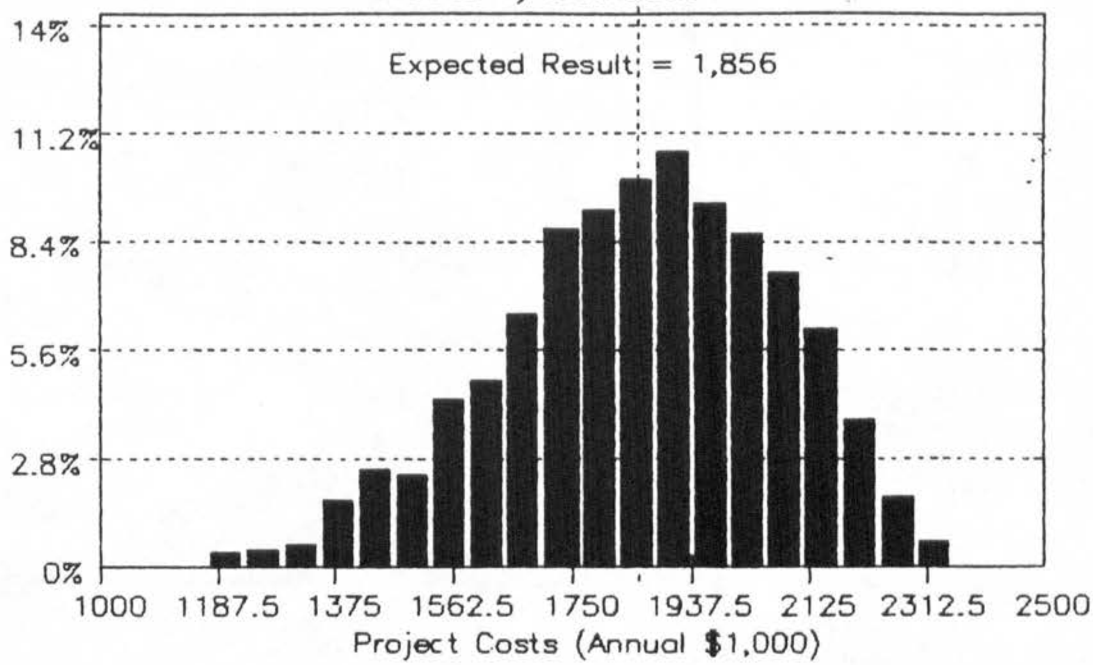


Figure 2
Blackwater Bayou
Probability Distribution

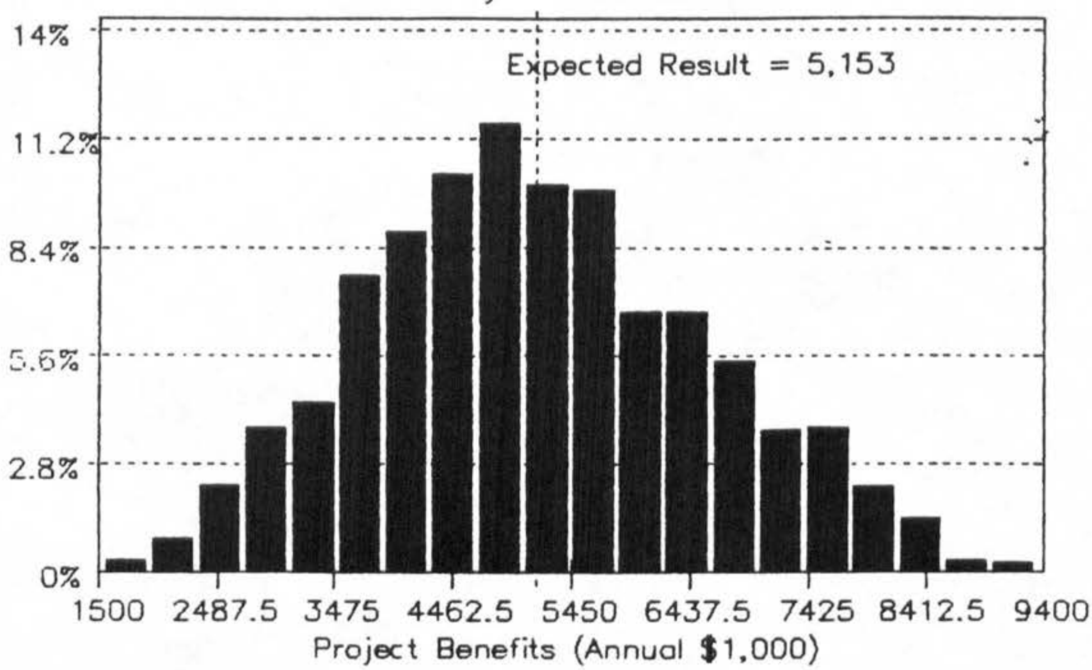


Figure 3
Blackwater Bayou
Probability Distribution

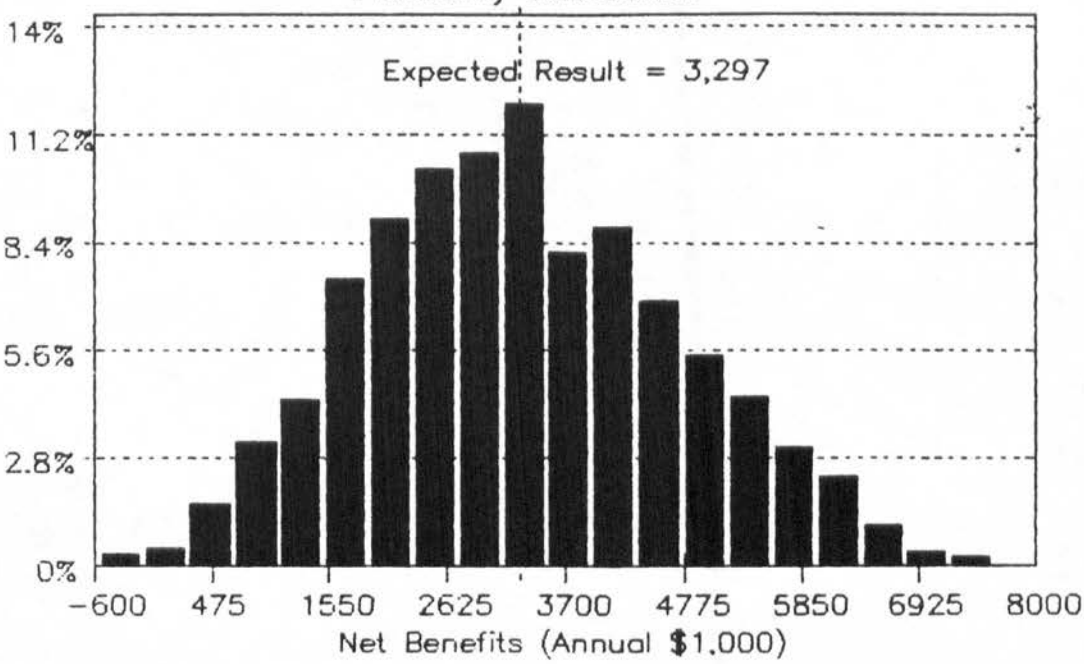
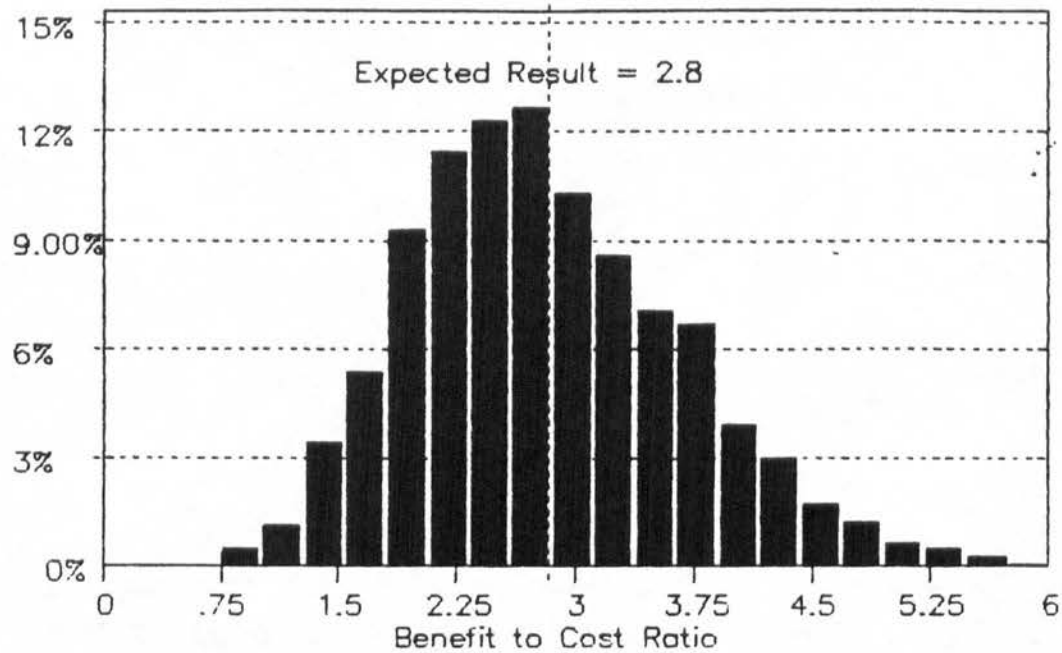


Figure 4
Blackwater Bayou
Probability Distribution



CALCULATIONS AND RESULTS. The calculated expected values for the project benefits, costs, net benefits, and benefit to cost ratio, as generated by the @ RISK program are compared to the single value estimates, as calculated by the traditional approach, in Table 23.

TABLE 23
BLACKWATER BAYOU RESULTS
(Annual $)

	SINGLE VALUE ESTIMATE	CALCULATED EXPECTED VALUE
PROJECT BENEFITS	$4,037,000	$5,153,000
PROJECT COSTS	$2,149,000	$1,856,000
NET BENEFITS	$1,888,000	$3,297,000
BENEFIT/COST RATIO	1.88	2.82
PROBABILITY OF PROJECT NET POSITIVE BENEFITS	N/A	99%

As shown in the table above, the project has a 99% chance of having positive net benefits and a B/C ratio greater than 1. The results also show that the expected value of the calculated net benefits of the project is greater than that of the single value estimate. This is primarily due to an expected reduction in costs for erosion control and private bridges.

BEAVER BAYOU. Five items were identified as having potential major variance on the overall feasibility of the project. These items and their estimated variance ranges are discussed below. The variance distribution for this watershed is displayed in Table 24. The minimum and maximum values provided in the table are based on output generated by the SID-EAD program. These results are shown graphically in Figures 5 through 8.

- Stage Frequency Values.

  Without project (existing) and with project floodstage frequency values directly affect existing and with project calculated damage dollar values. Variances on both existing and with project stages were determined to be practicably within plus or minus 1.0 feet for all storm frequency events for without project conditions, and, plus or minus 0.5 feet for with project conditions. See Engineering Appendix C. Damage values were recalculated incorporating this range. Applying the results, it is estimated that without project flood damages vary from minus $4,798,000 to plus $6,606,000 per year from the estimate. With project flood damages are estimated to vary from minus $535,000 to plus $536,000 per year from the single value estimate. Note that it was determined that there is likely to be some correlation between existing and with project stage frequency variance. A correlation factor of 0.5 was applied to this item in the "risk analysis" calculations described below.

- Structure Elevations.

  Variances in structure elevations directly affect both existing and with project calculated damage dollar values. Within practical limits, structure elevation variance was determined to be minus 0.5 to plus 0.5 feet. The calculated dollar value variance is minus $2,350,000 to plus $3,305,000 for existing annual damages, and, minus $536,000 to plus $535,000 for with project annual damages. Note that there is a direct correlation between existing and with

project variances. A correlation factor of 1.0 was therefore applied to this item in the "risk analysis" calculations described below.

- Structure Valuations.

  Variances in the estimate of structure values also affect both existing and with project calculated damage dollar value. Structure value variance range is estimated at plus or minus 10 percent frcm the single vaule estimate. Applying these results, it is estimated that existing flood damages vary from minus $881,000 to plus $876,000 per year. With project flood damages range from minus $107,000 to plus $106,000. A correlation factor of 1.0 is applicable to this set of values.

- Construction Costs.

  Estimated variances in calculated quantities, unit prices, constructability, and other factors were considered in calculating the channel construction cost estimate. The calculated cost range is from minus $7,380,000 to plus $2,070,000 relative to the single value estimate used for this item. Converting this range to equivalent annual dollars yields minus $738,000 to plus $207,000 per year.

- Erosion Control Measures.

  As stated above, the extent that erosion control measures (geosynthetic mat and rock) is needed throughout the watershed is uncertain. For the purposes of this study, a worst case condition, i.e., the need for erosion control for the entire channel, was considered and used as the basis for the most likely cost estimate for this item. Through field investigation it has been determined, however, that the need for erosion control may be significantly less extensive. The total channel length that may require erosion control measures could be less than 25 percent of the total. Since this item is discounted to a degree in the variance estimate of

construction cost, it was determined that the variance for this specific feature should be minus 50 percent to plus 5 percent from the single value cost estimate. In first cost this range is from minus \$3,000,000 to plus \$300,000. Conversion to equivalent annual dollars yields a range of minus \$300,000 to plus \$30,000 per year.

TABLE 24
VARIANCE DISTRIBUTIONS FOR BEAVER BAYOU

BASE VALUES: ($1,000/YEAR) BENEFITS: $8,779
COSTS: $2,034

ITEM	VARIANCE DISTRIBUTION ($1,000/YEAR)
Existing Damages- ± 1 ft. Stage Frequency Values	Triangle Distribution Minimum: -$4,798 Most Likely: $0 Maximum: $6,606
Existing Damages- ± 0.5 ft. Structure Elevations	Triangle Distribution Minimum: -$2,350 Most Likely: $0 Maximum : $3,305
Existing Damages- Structure Value Range ± 10 %	Uniform Distribution Minimum: -$881 Maximum: $876
With Project Damages- ± 0.5 ft. Stage Frequency Values	Triangle Distribution Minimum: -$536 Most Likely: $0 Maximum: $535 (0.5 Correlation to Existing Stage Frequency)
With Project Damages- ± 0.5 ft. Structure Elevations	Triangle Distribution Minimum: -$536 Most Likely: $0 Maximum: $535 (1.0 Correlated to Existing Structure Elevations)

TABLE 24 (Continued)
VARIANCE DISTRIBUTIONS FOR BEAVER BAYOU

ITEM	VARIANCE DISTRIBUTION ($1,000/YEAR)
With Project Damages- Structure Value Range ± 10 %	Uniform Distribution Minimum: -$107 Maximum: $106 (1.0 Correlation to Existing Structure Values)
Project Costs- Channel Construction Costs	Triangle Distribution Minimum: -$738 Most Likely: $0 Maximum: $207
Project Costs- Erosion Control Costs	Triangle Distribution Minimum: -$300 Most Likely: $0 Maximum: $30

Figure 5
Beaver Bayou
Probability Distribution

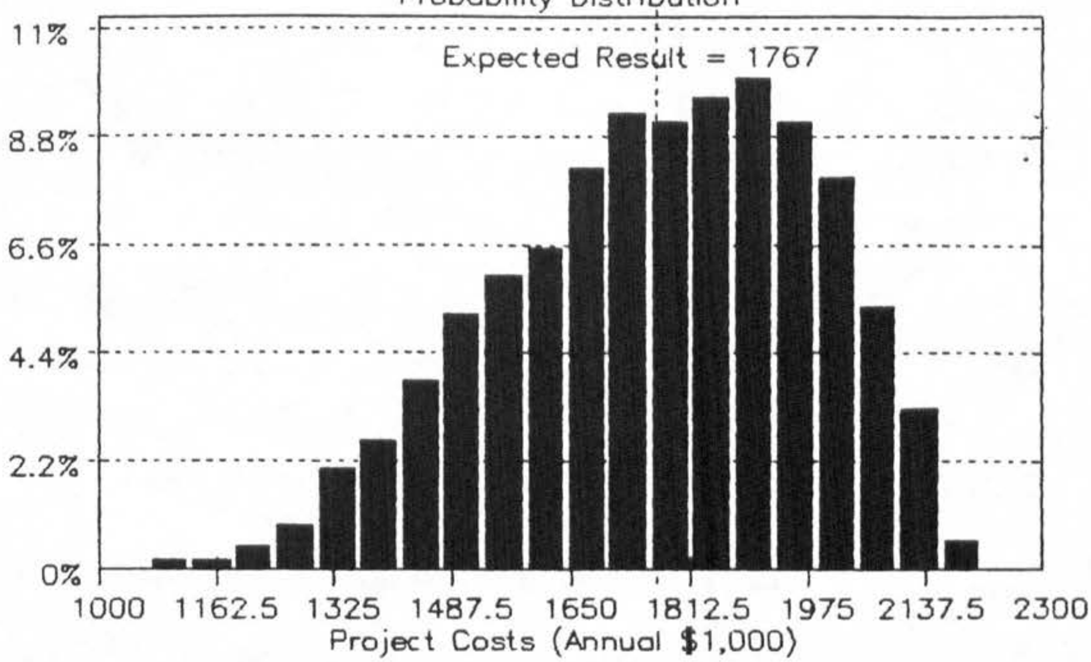


Figure 6
Beaver Bayou
Probability Distribution

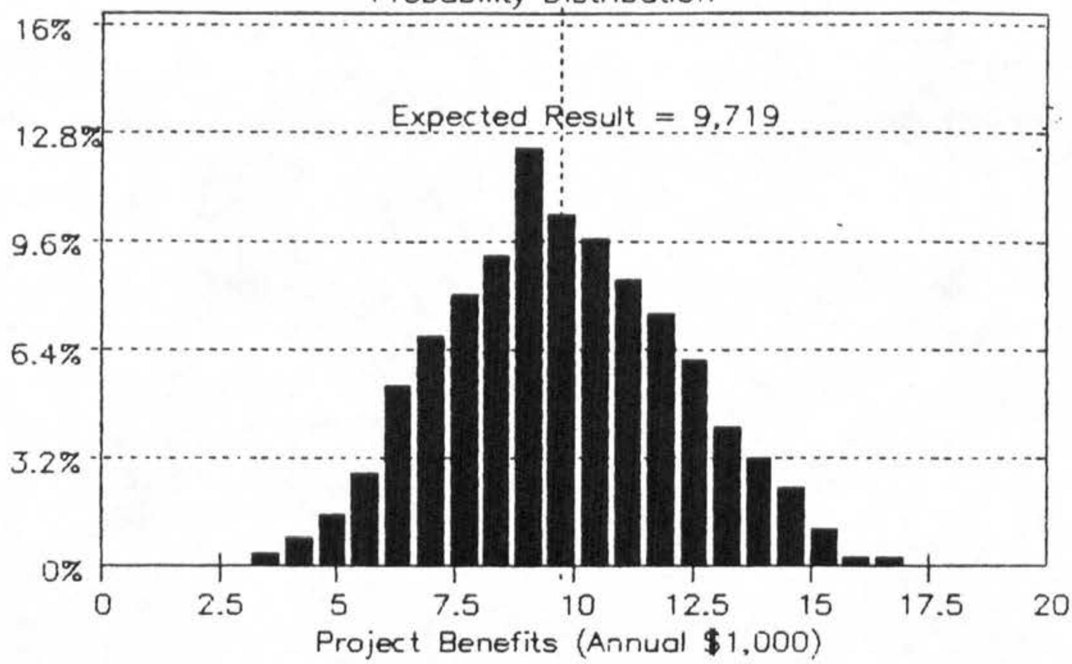


Figure 7
Beaver Bayou
Probability Distribution

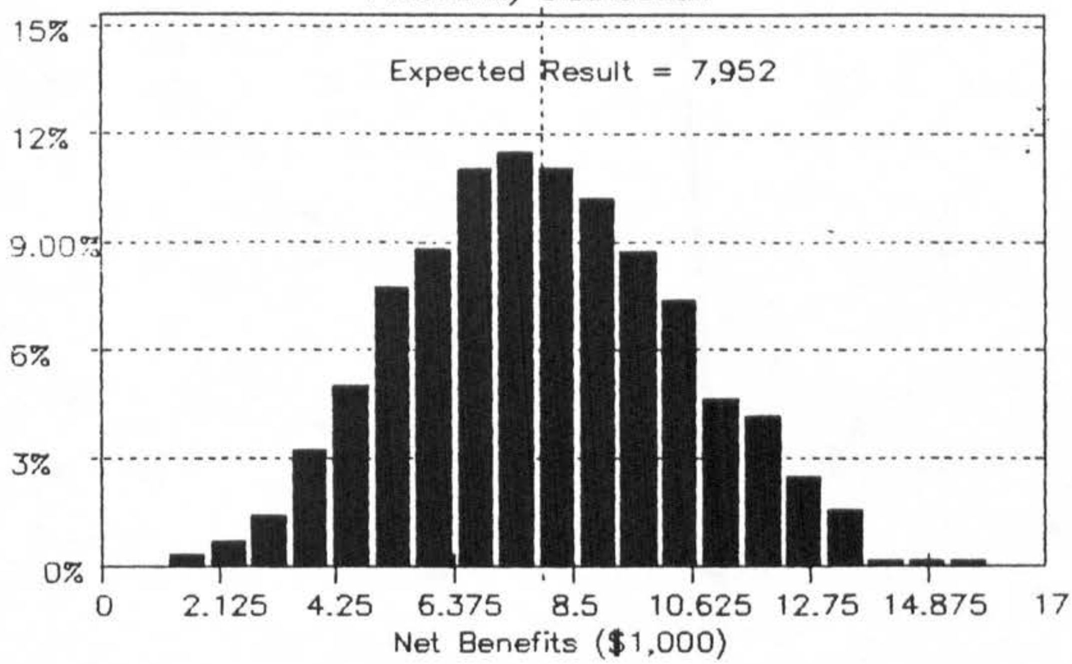
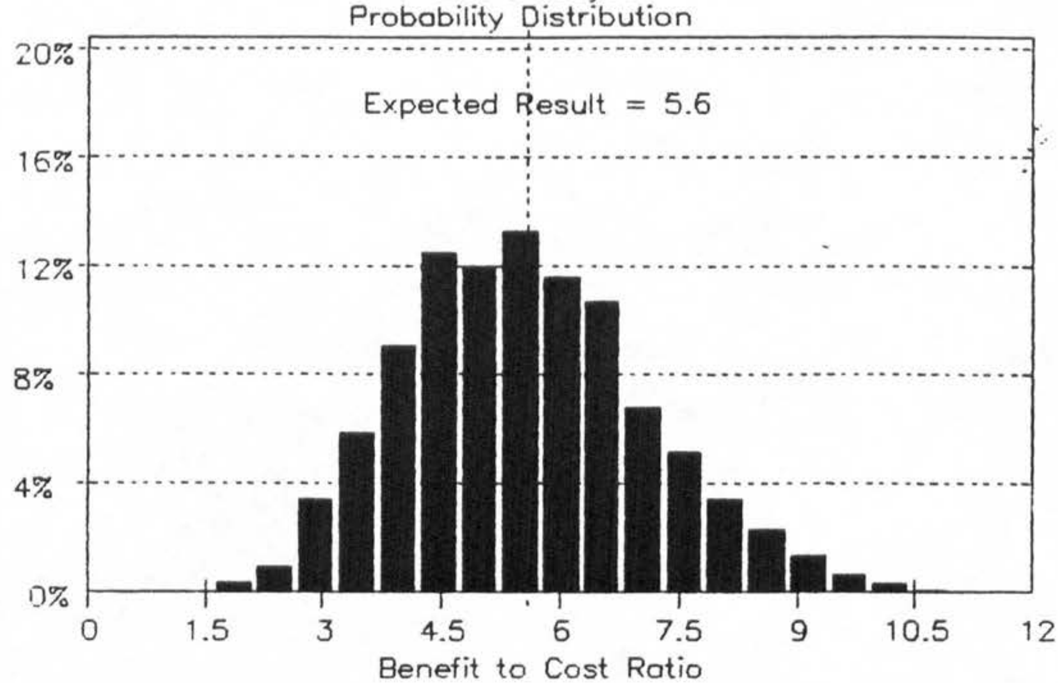


Figure 8
Beaver Bayou
Probability Distribution



CALCULATIONS AND RESULTS. The calculated expected values for the project benefits, costs, net benefits, and benefit to cost ratio, as generated by the @ RISK program are compared to the single value estimates, as calculated by the traditional approach, in Table 25.

TABLE 25
BEAVER BAYOU RESULTS
(Annual $)

	SINGLE VALUE ESTIMATE	CALCULATED EXPECTED VALUE
PROJECT BENEFITS	$8,799,000	$9,719,000
PROJECT COSTS	$2,034,000	$1,767,000
NET BENEFITS	$6,765,000	$7,952,000
BENEFIT/COST RATIO	4.32	5.59
PROBABILITY OF PROJECT NET POSITIVE BENEFITS	N/A	99%

As shown in the table above, the project has a 99% chance of having positive net benefits and a B/C ratio greater than 1. The results also show that the expected value of the calculated net benefits of the project is greater than that of the single value estimate. This is primarily due to an expected reduction in costs for erosian control and private bridges.

JONES CREEK. Six items were identified as having potential major variance on the overall project's feasibility. These items and their estimated variance ranges are discussed below. The variance distribution for this watershed is displayed in Table 26. The minimum and maximum values provided in the table are based on output generated by the SID-EAD program. These results are shown graphically in Figures 9 through 12.

- Stage Frequency Values.

  Without project (existing) and with project floodstage frequency values directly affect existing and with project calculated damage dollar values. Variances on stages were determined to be within plus or minus 1.0 feet for all storm frequency events for without project conditions, and, plus or minus 0.5 feet for with project conditions. See Engineering Appendix C. Damage values were recalculated incorporating this range. Applying the results, it is estimated that without project flood damages vary from minus $4,721,000 to plus $10,231,000 per year from the single value estimate. With project flood damages are estimated to vary from minus $42,000 to plus $45,000 per year from the single value estimate. Note that it was determined that there is likely to be some correlation between existing and with project stage frequency variance. A correlation factor of 0.5 was applied to this item in the "risk analysis" calculations described below.

- Structure Elevations.

  Variances in structure elevations directly affect both existing and with project calculated damage dollar values. Within practical limits, structure elevation variance was determined to be minus 0.5 to plus 0.5 feet. The calculated dollar value variance is minus $3,772,000 to plus $1,901,000 for existing annual damages, and, minus $42,000 to plus $45,000 for with project annual damages. Note that there is a direct correlation between existing and with project variances. A correlation factor of 1.0 was

therefore applied to this item in the "risk analysis" calculations described below.

- Structure Valuations.

  Variances in the estimate of structure values also affect both existing and with project calculated damage dollar value. Structure value variance range is estimated at plus or minus 10 percent from the single vaule estimate. Damage values were recalculated incorporating this range.

  Applying these results, it is estimated that existing flood damages vary from minus $758,000 to plus $784,000 per year. With project flood damages range from minus $9,000 to plus $9,000. A correlation factor of 1.0 is applicable to this set of values.

- Construction Costs.

  Estimated variances in calculated quantities, unit prices, constructability, and other factors were considered in calculating the channel construction cost estimate. The calculated cost range is from minus $20,805,000 to plus $2,660,000 relative to the single value estimate used for this item. Converting this range to equivalent annual dollars yields minus $2,080,000 to plus $266,000 per year.

- Erosion Abatement Benefits.

  The estimated annual benefits calculated for erosion abatement are quite speculative. A plus or minus range of 50 percent should be considered for this item. This adjustment range is minus $196,000 to plus $196,000 per year.

- Property Utility Values

  In addition to the loss of "land" property, the strong probability exists that significant or entire property utility values will be

lost over time if the channels in this watershed are not paved. That is to say, for example, that an existing home purchased at $85,000 may not be able to be sold at any price if the backyard has sloughed into the channel. Furthermore, it is quite likely that unabated erosion will result in direct damage to structures, given time. Through field investigation, it is estimated that up to 50 properties could lose their utility values within five years given present conditions. These properties consist of residential and a small number of small commercial sites. It is therefore estimated that apotential loss of 33,000 per each property ($3.25 million) could possibly occur in five years. Discounting over the five year period and conversion to annual dollars yields $111,000 per year. Since this item was not considered in the most likely estimate of benefits for this plan, a range of minus $0 to plus $111,000 per year was considered for this additional item.

TABLE 26
VARIANCE DISTRIBUTIONS FOR JONES CREEK

BASE VALUES: ($1,000/YEAR)

BENEFITS:	$9,849
COSTS:	$5,334

ITEM	VARIANCE DISTRIBUTION ($1,000/YEAR)
Existing Damages- ± 1 ft. Stage Frequency Values	Triangle Distribution Minimum: -$4,721 Most Likely: $0 Maximum: $10,231
Existing Damages- ± 0.5 ft. Structure Elevations	Triangle Distribution Minimum: -$3,772 Most Likely: $0 Maximum : $1,901
Existing Damages- Structure Value Range ± 10 %	Uniform Distribution Minimum: -$758 Maximum: $784
With Project Damages- ± 0.5 ft. Stage Frequency Values	Triangle Distribution Minimum: -$42 Most Likely: $0 Maximum: $45 (0.5 Correlation to Existing Stage Frequency)
With Project Damages- ± 0.5 ft. Structure Elevations	Triangle Distribution Minimum: -$42 Most Likely: $0 Maximum: $45 (1.0 Correlated to Existing Structure Elevations)

TABLE 26 (Continued)
VARIANCE DISTRIBUTIONS FOR JONES CREEK

ITEM	VARIANCE DISTRIBUTION ($1,000/YEAR)
With Project Damages- Structure Value Range ± 10 %	Uniform Distribution Minimum: -$9 Maximum: $9 (1.0 Correlation to Existing Structure Values)
Project Costs- Channel Construction Costs	Triangle Distribution Minimum: -$2,190 Most Likely: $0 Maximum: $280
With Project Benefits- Erosion Abatement	Triangle Distribution Minimum: -$196 Most Likely: $0 Maximum: $196
With Project Benefits- Property Utility Values	Triangle Distribution Minimum: $0 Most Likely: $0 Maximum: $111

Figure 9
Jones Creek
Probability Distribution

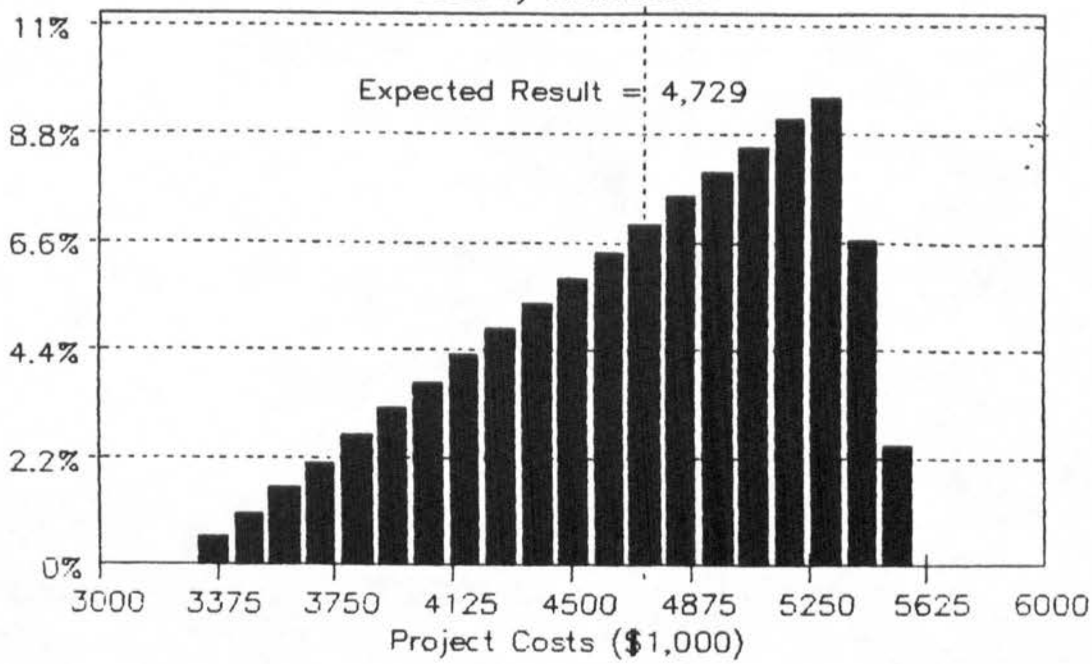


Figure 10
Jones Creek
Probability Distribution

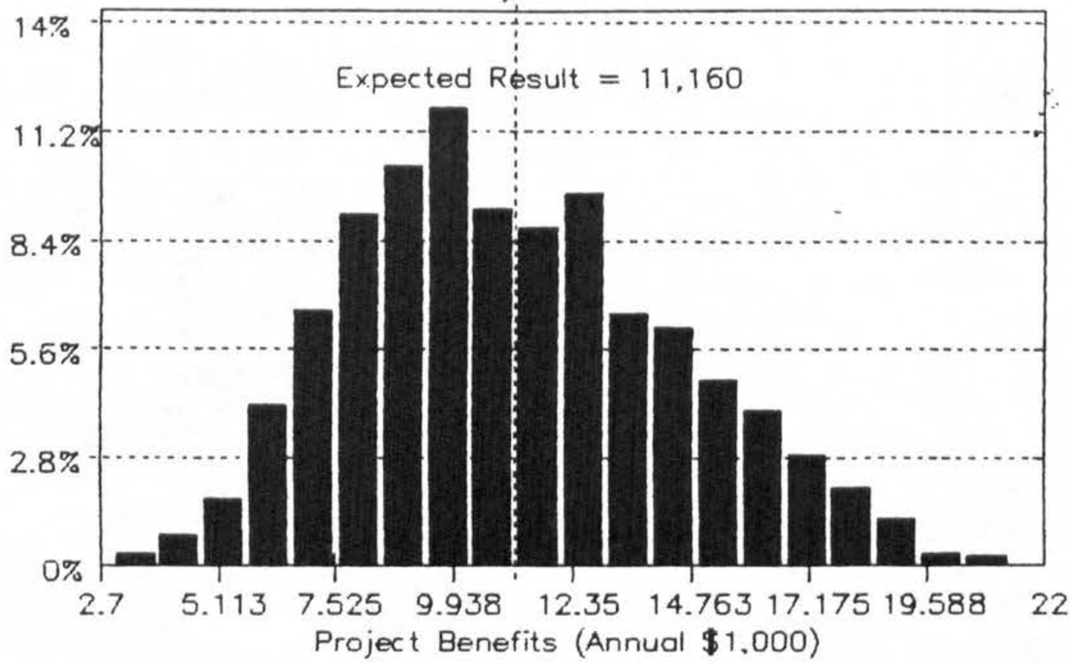


Figure 11
Jones Creek
Probability Distribution

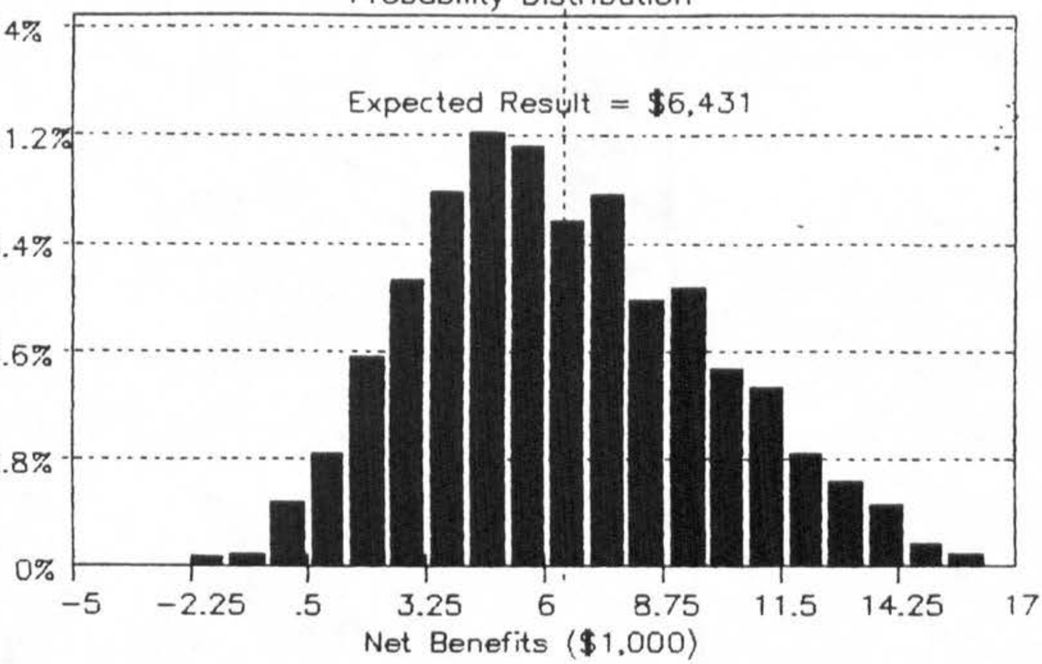
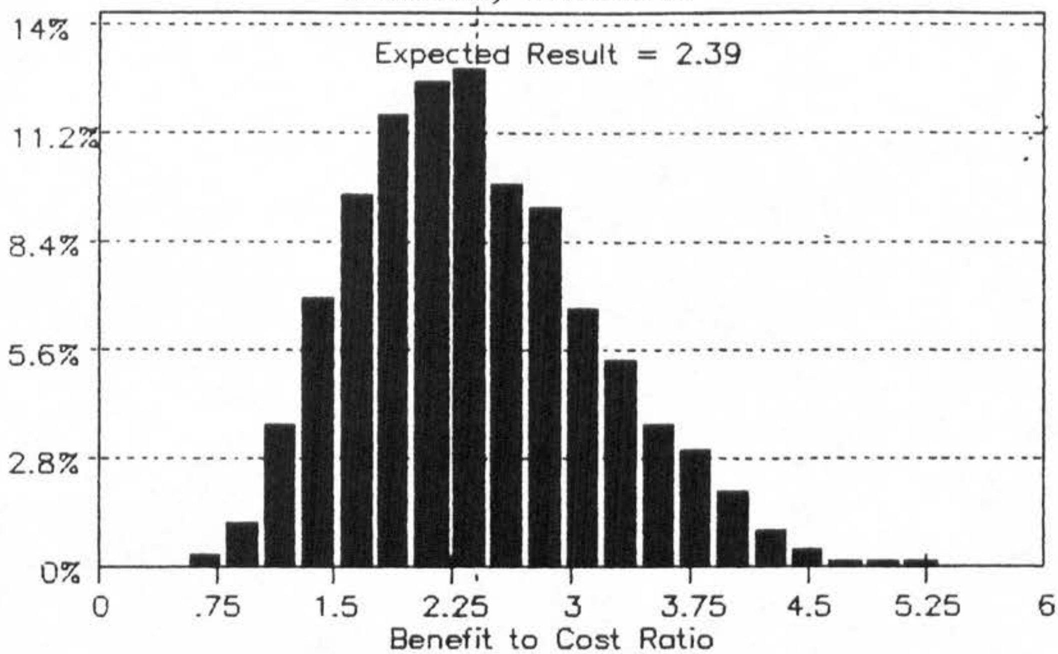


Figure 12
Jones Creek
Probability Distribution



CALCULATIONS AND RESULTS. The calculated expected values for the project benefits, costs, net benefits, and benefit to cost ratio, as generated by the @ RISK program are compared to the single value estimates, as calculated by the traditional approach, in Table 27.

TABLE 27
JONES CREEK RESULTS
(Annual $)

	SINGLE VALUE ESTIMATE	CALCULATED EXPECTED VALUE
PROJECT BENEFITS	$9,899,000	$11,160,000
PROJECT COSTS	$5,334,000	$ 4,729,000
NET BENEFITS	$4,565,000	$ 6,431,000
BENEFIT/COST RATIO	1.86	2.39
PROBABILITY OF PROJECT NET POSITIVE BENEFITS	N/A	98%

As shown in the table above, the project has a 98% chance of having positive net benefits and a B/C ratio greater than 1. The results also show that the expected value of the calculated net benefits of the project is greater than that of the single value estimate. This primarily due to an expected reduction in costs for erosian control and private bridges.

WARD CREEK. Six items were identified as having potential major variance on the overall feasibility of the project. These items and their estimated variance ranges are discussed below. The variance distribution for this watershed is displayed in Table 28. The minimum and maximum values provided in the table are based on output generated by the SID-EAD program. These results are shown graphically in Figures 13 through 16.

- Stage Frequency Values.

  Without project (existing) and with project floodstage frequency values directly affect existing and with project calculated damage dollar values. Variances on both existing and with project stages were determined to be within plus or minus 1.0 feet for all storm frequency events, and, for both without and with project conditions. See Engineering Appendix C. Damage values were recalculated incorporating this range. Applying the results, it is estimated that without project flood damages vary from minus $1,953,000 to plus $4,950,000 per year from the most likely estimate. With project flood damages are estimated to vary from minus $1,462,000 to plus $3,469,000 per year from the most likely estimate. Note that it was determined that there is likely to be a very high correlation between existing and with project stage frequency variance. This is due to the fact that the majority of the project calls for clearing and snagging only, which will not significantly alter channel configuration. A correlation factor of 0.95 was applied to this item in the "risk analysis" calculations described below.

- Structure Elevations.

  Variances in structure elevations directly affect both existing and with project calculated damage dollar values. Within practical limits, structure elevation variance was determined to be minus 0.5 to plus 0.5 feet. The calculated dollar value variance is minus $975,000 to plus $2,480,000 for existing annual damages, and, minus $730,000 to plus

$1,740,000 for with project annual damages. Note that there is a direct correlation between existing and with project variances. A correlation factor of 1.0 was therefore applied to this item in the "risk analysis" calculations described below.

- Structure Valuations.

  Variances in the estimate of structure values also affect both existing and with project calculated damage dollar value. Structure value variance range is estimated at minus 10 percent to plus 10 percent from the single value estimate. Damage values were recalculated incorporating this range.

  Applying these results, it is estimated that existing flood damages vary from minus $277,000 to plus $260,000 per year. With project flood damages range from minus $203,000 to plus $191,000. As in the case of structure elevation variance, there is a one-to-one correlation between existing and with project probability ranges.

- Construction Costs.

  Estimated variances in calculated quantities, unit prices, constructability, and other factors were considered in calculating the channel construction cost estimate. The calculated cost range is from minus $3,600,000 to plus $430,000 per year relative to the single value estimate used for this item. Converting this range to equivalent annual dollars yields minus $360,000 to plus $43,000 per year.

- Erosion Abatement Benefits.

  The estimated annual benefits calculated for erosion abatement are quite speculative. A plus or minus range of 50 percent should be considered for this item. This adjustment range is minus $45,000 to plus $45,000 per year.

- Property Utility Values

In addition to the loss of "land" property, the strong probability exists that significant or entire property utility values will be lost over time if the channels in this watershed are not paved. That is to say, for example, that an existing home purchased at $75,000 may not be able to be sold at any price if the backyard has sloughed into the channel. Furthermore, it is quite likely that unabated erosion will result in direct damage to structures, given time. Through field investigation, it is estimated that up to ten residential and one 3-story office building properties could lose their utility values within five years given present conditions. It was estimated that a potential loss of $33,000 per each residential property ($330,000), plus a $2,000,000 loss for the office building could occur in five years. Discounting over the five year period and conversion to annual dollars yields $158,000 per year. Since this item was not considered in the most likely estimate of benefits for this plan, a range of minus $0 to plus $158,000 per year was considered for this additional item.

TABLE 28
VARIANCE DISTRIBUTIONS FOR WARD CREEK

BASE VALUES: ($1,000/YEAR)

BENEFITS:	$1,085
COSTS:	$ 924

ITEM	VARIANCE DISTRIBUTION ($1,000/YEAR)
Existing Damages- ± 1 ft. Stage Frequency Values	Triangle Distribution Minimum: -$1,953 Most Likely: $0 Maximum: $4,950
Existing Damages- ± 0.5 ft. Structure Elevations	Triangle Distribution Minimum: -$975 Most Likely: $0 Maximum : $2,480
Existing Damages- Structure Value Range ± 10 %	Uniform Distribution Minimum: -$277 Maximum: $260
With Project Damages- ± 1 ft. Stage Frequency Values	Triangle Distribution Minimum: -$1,462 Most Likely: $0 Maximum: $3,469 (0.95 Correlation to Existing Stage Frequency)
With Project Damages- ± 0.5 ft. Structure Elevations	Triangle Distribution Minimum: -$730 Most Likely: $0 Maximum: $1,740 (1.0 Correlated to Existing Structure Elevations)

TABLE 28 (Continued)
VARIANCE DISTRIBUTIONS FOR WARD CREEK

ITEM	VARIANCE DISTRIBUTION ($1,000/YEAR)
With Project Damages- Structure Value Range ± 10 %	Uniform Distribution Minimum: -$203 Maximum: $191 (1.0 Correlation to Existing Structure Values)
Project Costs- Channel Construction Costs	Triangle Distribution Minimum: -$360 Most Likely: $0 Maximum: $43
With Project Benefits- Erosion Abatement	Triangle Distribution Minimum: -$45 Most Likely: $0 Maximum: $45
With Project Benefits- Property Utility Values	Triangle Distribution Minimum: $0 Most Likely: $0 Maximum: $158

Figure 13
Ward Creek
Probability Distribution

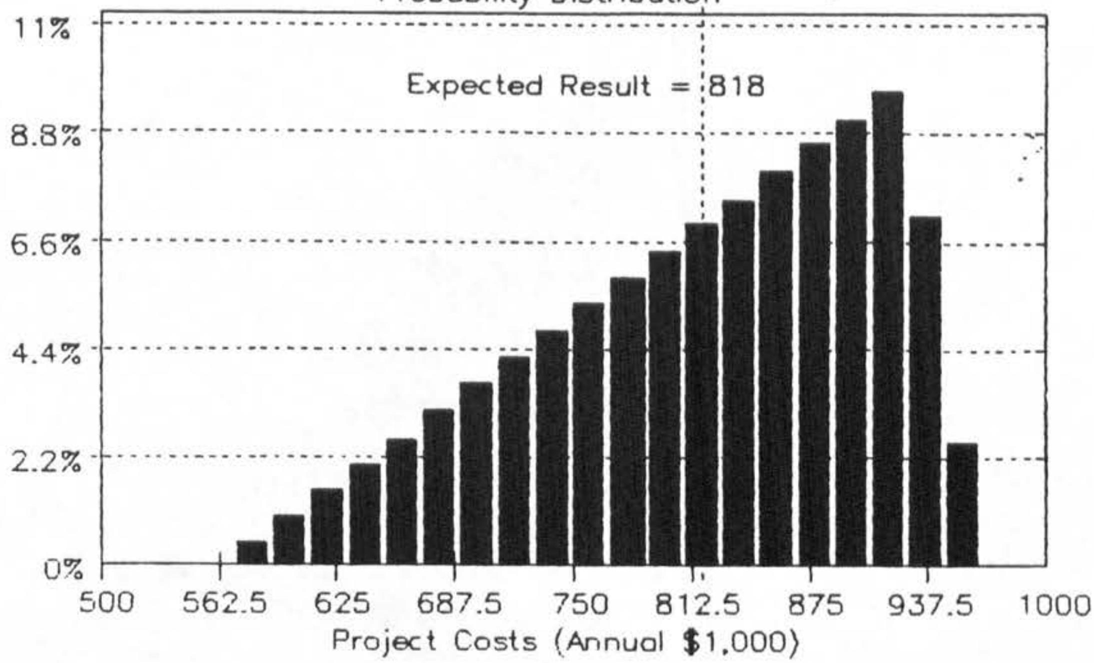
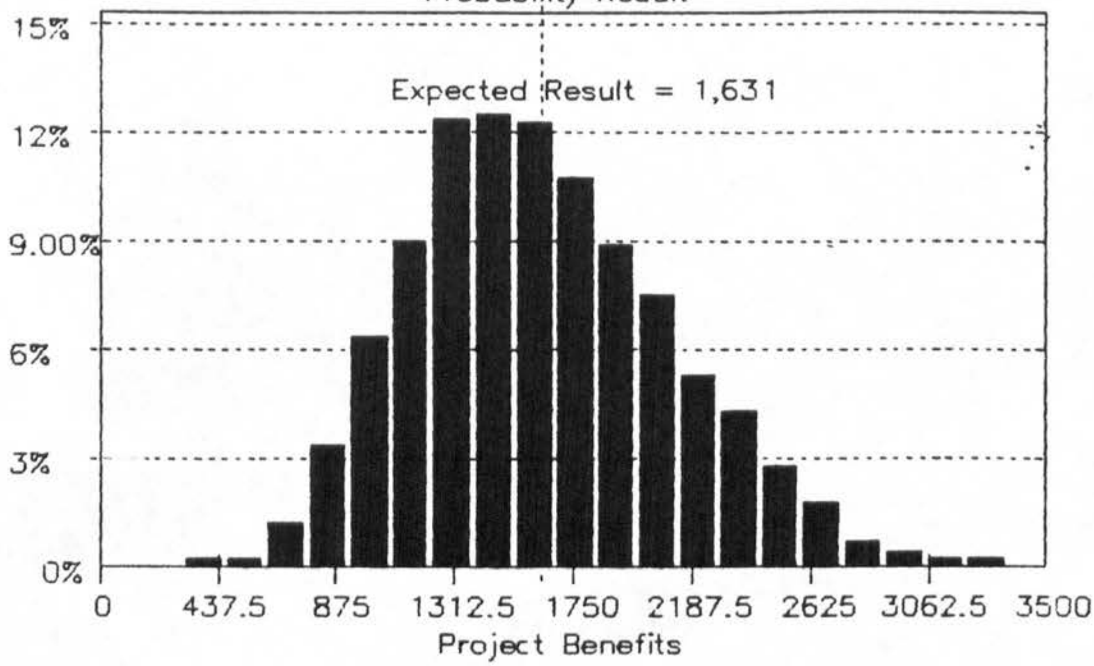


Figure 14
Ward Creek
Probability Result



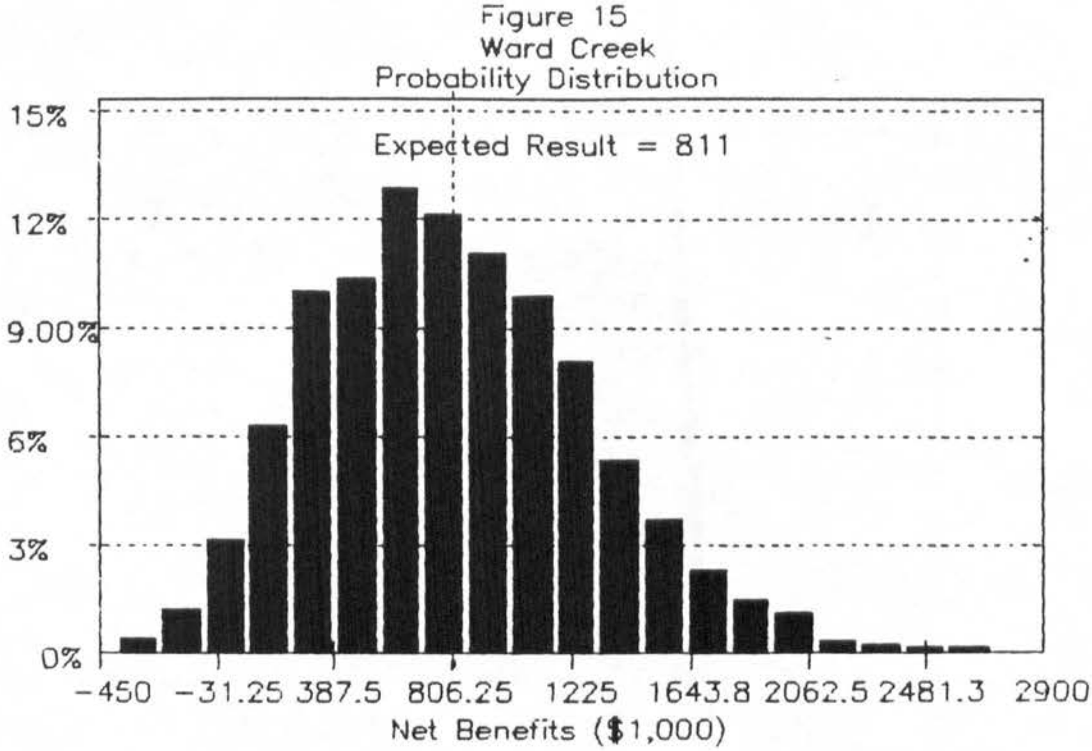
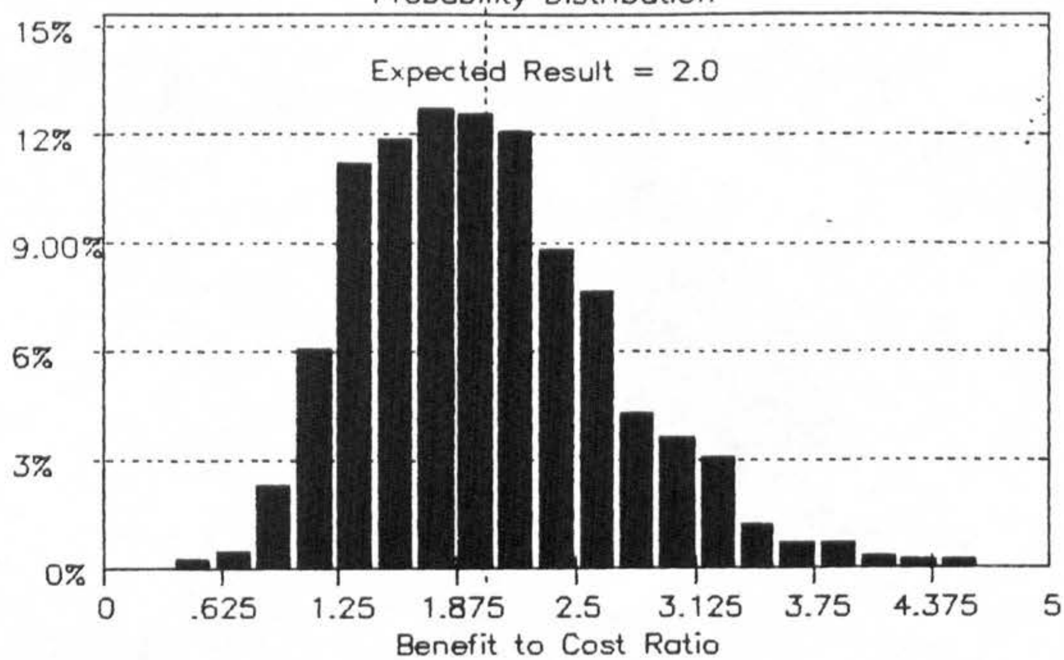


Figure 15
Ward Creek
Probability Distribution
Expected Result = 811
15%
12%
9.00%
6%
3%
0%
-450
-31.25
387.5
806.25
1225
1643.8
2062.5
2481.3
2900
Net Benefits ($1,000)

Figure 16
Ward Creek
Probability Distribution



CALCULATIONS AND RESULTS. The calculated expected values for the project benefits, costs, net benefits, and benefit to cost ratio, as generated by the @ RISK program are compared to the single value estimates, as calculated by the traditional approach, in Table 29.

TABLE 29
WARD CREEK RESULTS
(Annual $)

	SINGLE VALUE ESTIMATE	CALCULATED EXPECTED VALUE
PROJECT BENEFITS	$1,085,000	$1,631,000
PROJECT COSTS	$ 924,000	$ 818,000
NET BENEFITS	$ 161,000	$ 813,000
BENEFIT/COST RATIO	1.17	1.99
PROBABILITY OF PROJECT NET POSITIVE BENEFITS	N/A	97%

As shown in the table above, the project has a 97% chance of having positive net benefits and a B/C ratio greater than 1. The results also show that the expected value of the calculated net benefits of the is significantly greater than that of the single value estimate. This increase was due primarily to the high sensitivity of both calculated existing and with project damages, given a flood stage frequency or structure elevation variance of plus or minus 1.0 feet. This effect is somewhat compounded given the fact that a relatively high percentage of flood damages remains in the watershed with the Tentatively Selected Plan in place.

BAYOU FOUNTAIN. Four items were identified as having potential major variance on the overall project's feasibility. These items and their estimated variance ranges are discussed below. The variance distribution for this watershed is displayed in Table 30. The minimum and maximum values provided in the table are based on output generated by the SID-EAD program. These results are displayed in Figures 17 through 20.

- Stage Frequency Values.

  Without project (existing) and with project floodstage frequency values directly affect existing and with project calculated damage dollar values. Variances on both existing and with project stages were determined to be within plus or minus 0.5 feet for all storm frequency events, and, for both without and with project conditions. See Engineering Appendix C. Damage values were recalculated incorporating this range. Applying the results, it is estimated that without project flood damages vary from minus $934,000 to plus $914,000 per year from the single value estimate. With project flood damages are estimated to vary from minus $627,000 to plus $883,000 per year from the single value estimate. Note that it was determined that there is likely to be a high correlation between without and with project stage frequency variance. This is due to the fact that the majority of the project calls for only clearing and snagging which will not significantly alter channel configuration. A correlation factor of 0.75 was applied to this item in the "risk analysis" calculations described below.

- Structure Elevations.

  Variances in structure elevations directly affect both existing and with project calculated damage dollar values. Within practical limits, structure elevation variance was determined to be minus 0.5 to plus 0.5 feet. The calculated dollar value variance is minus $934,000 to plus $914,000 for existing annual damages, and, minus $627,000 to plus $883,000 for with project annual damages. Note that there is

a direct correlation between existing and with project variances. A correlation factor of 1.0 was therefore applied to this item in the "risk analysis" calculations described below.

- Structure Valuations.

  Variances in the estimate of structure values also affect both existing and with project calculated damage dollar value. Structure value variance range is estimated at minus 10 percent to plus 10 percent from the calculated single value. Damage values were recalculated incorporating this range. Applying these results, it is estimated that existing flood damages vary from minus $226,000 to plus $92,000 per year. With project flood damages range from minus $177,000 to plus $45,000.

- Construction Costs.

  Estimated variances in calculated quantities, unit prices, constructability, and other factors were considered in calculating the channel construction cost estimate. The calculated cost range is minus $850,000 to plus $210,000 relative to the single value estimate used for this item. Converting this range to equivalent annual dollars yields minus $85,000 to plus $21,000 per year.

TABLE 30
VARIANCE DISTRIBUTIONS FOR BAYOU FOUNTAIN

BASE VALUES: ($1,000/YEAR) — BENEFITS: $558; COSTS: $480

ITEM	VARIANCE DISTRIBUTION ($1,000/YEAR)
Existing Damages- ± 0.5 ft. Stage Frequency Values	Triangle Distribution Minimum: -$934 Most Likely: $0 Maximum: $914
Existing Damages- ± 0.5 ft. Structure Elevations	Triangle Distribution Minimum: -$934 Most Likely: $0 Maximum : $914
Existing Damages- Structure Value Range ± 10 %	Uniform Distribution Minimum: -$226 Maximum: $92
With Project Damages- ± 0.5 ft. Stage Frequency Values	Triangle Distribution Minimum: -$627 Most Likely: $0 Maximum: $883 (0.75 Correlation to Existing Stage Frequency)
With Project Damages- ± 0.5 ft. Structure Elevations	Triangle Distribution Minimum: -$627 Most Likely: $0 Maximum: $883 (1.0 Correlated to Existing Structure Elevations)

TABLE 30 (Continued)
VARIANCE DISTRIBUTIONS FOR BAYOU FOUNTAIN

ITEM	VARIANCE DISTRIBUTION ($1,000/YEAR)
With Project Damages- Structure Value Range ± 10 %	Uniform Distribution Minimum: -$177 Maximum: $45 (1.0 Correlation to Existing Structure Values)
Project Costs- Channel Construction Costs	Triangle Distribution Minimum: -$85 Most Likely: $0 Maximum: $21

Figure 17
Bayou Fountain
Probability Distribution

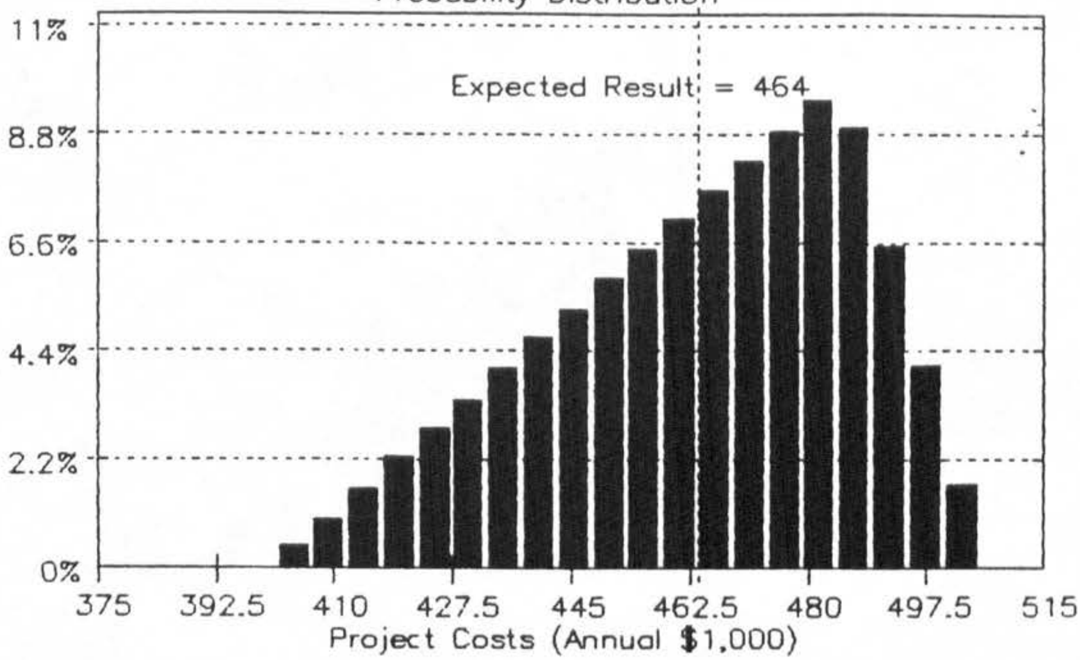


Figure 18
Bayou Fountain
Probability Distribution

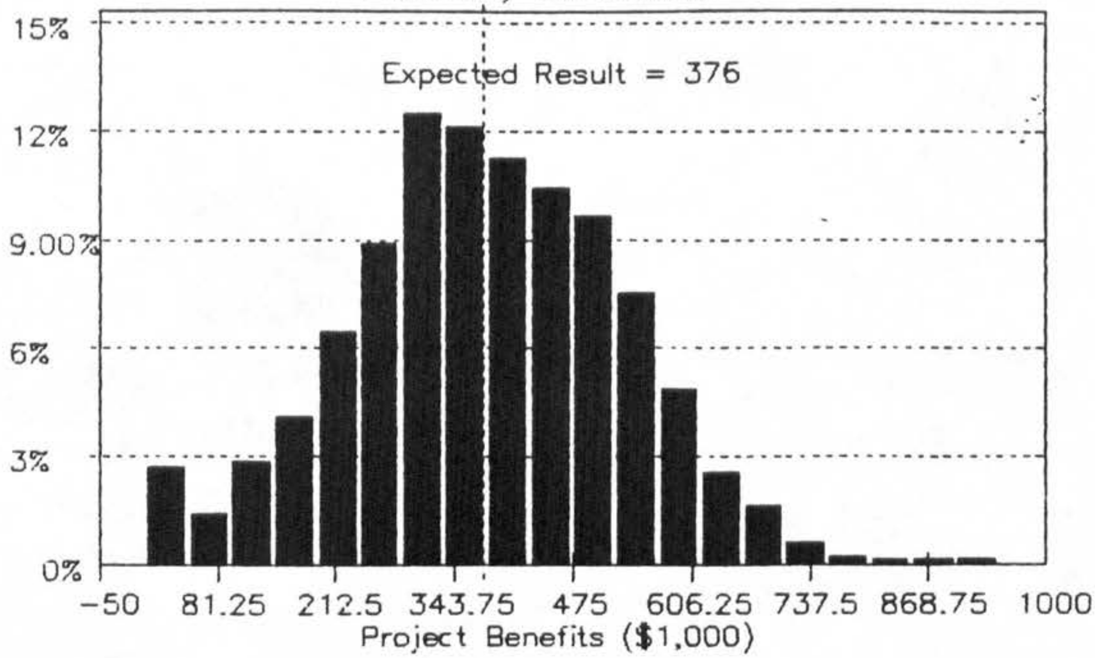


Figure 19
Bayou Fountain
Probability Distribution

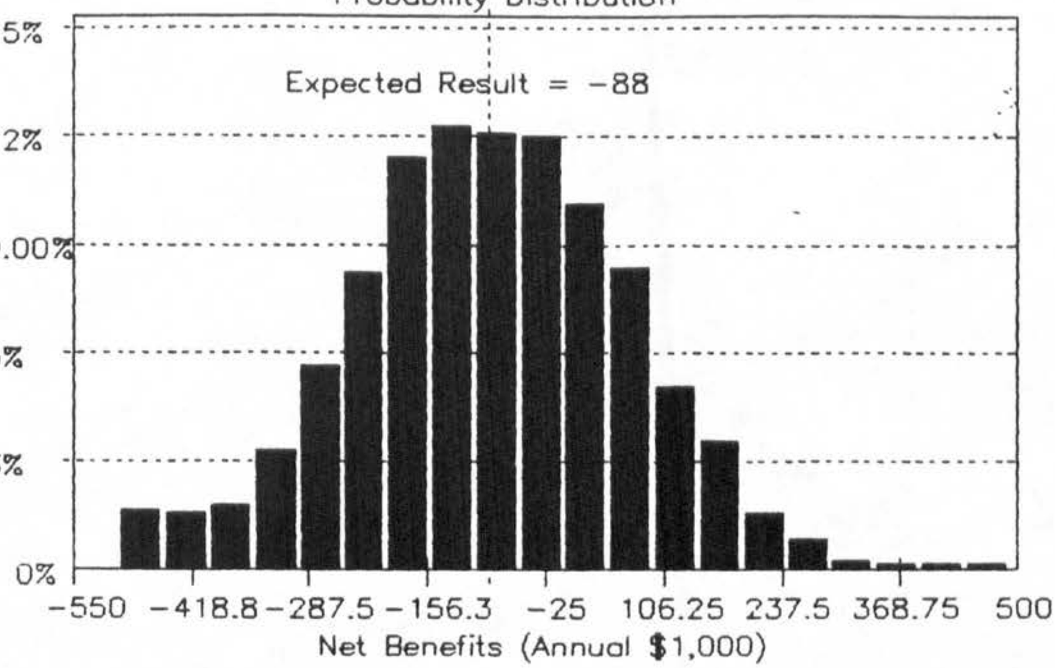
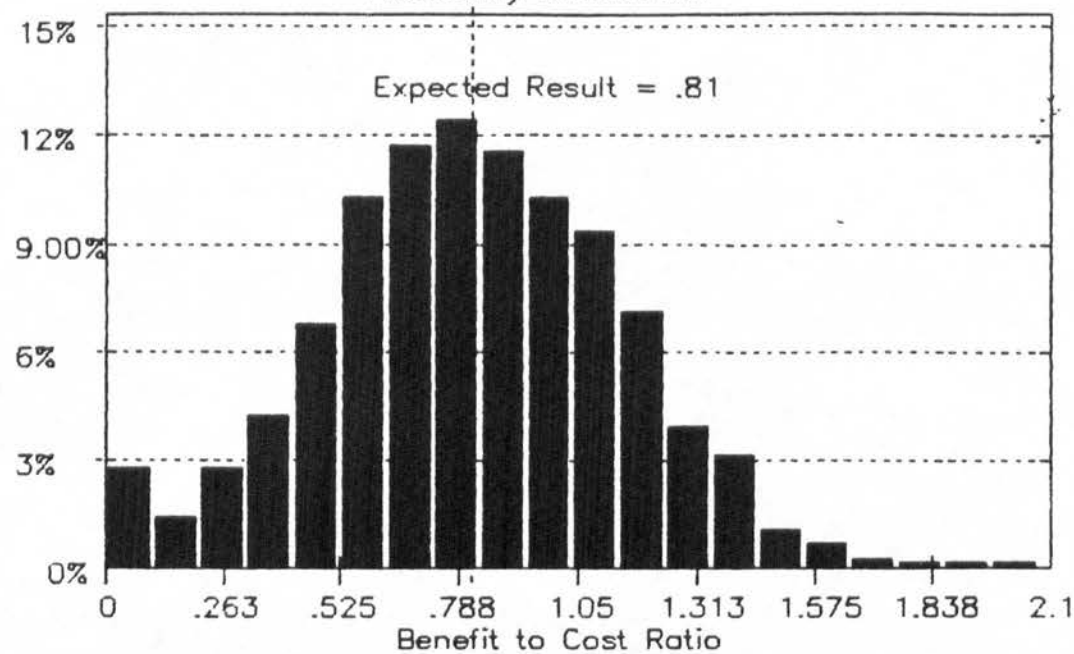


Figure 20
Bayou Fountain
Probability Distribution



CALCULATIONS AND RESULTS. The calculated expected values for the project benefits, costs, net benefits, and benefit to cost ratio, as generated by the @ RISK program are compared to the single value estimates, as calculated by the traditional approach, in Table 31.

TABLE 31
BAYOU FOUNTAIN RESULTS
(Annual $)

	Single Value Estimate	Calculated Expected Value
Project Benefits	$558,000	$376,000
Project Costs	$485,000	$464,000
Net Benefits	$ 73,000	($88,000)
Benefit/Cost Ratio	1.15	0.81
Probability of Project Net Positive Benefits	N/A	29%

As shown in the table above, the project has a 29% chance of having positive net benefits and a B/C ratio greater than 1. The results also show that the expected value of the calculated project benefits of the project is significantly less than that of the single value estimate. This decrease was due primarily to the high sensitivity of both calculated existing and with project damages given a flood stage frequency or structure elevation variance of plus or minus 0.5 feet. This high sensitivity was not surprising given the relatively flat floodplain area.

PRELIMINARY REVIEW OF FINANCING PLAN

As required by ER 1105-2-100, detailed analysis of the local sponsor's financing plan and overall creditworthiness will be conducted during the preconstruction engineering and design phase. The analysis will be included as a commander's assessment which will accompany the financing plan in the local cooperation agreement package.

The City of Baton Rouge and Parish of East Baton Rouge, Louisiana, are the potential local sponsors for the recommended plan. The financing plan is contained herein. As shown in the correspondence attached to their plan, they enjoy favorable bond ratings, have sufficient bond capacity, and have the legal authority to levy taxes and issue debts for this project.

Department of Finance
Administration Division

City of Baton Rouge
Parish of East Baton Rouge

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70821

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November 18, 1994

Colonel Kenneth H. Clow
District Engineer
U.S. Army Corps of Engineers
Attention: CELMN-PD-FB
P. O. Box 60267
New Orleans, LA 70160-0267

ATTENTION: Frank Vicidomina

Dear Colonel Clow:

The citizens of East Baton Rouge Parish have been subjected to substantial flood damages resulting from heavy rainfall, causing rainfall runoff that exceeds the capacity of the major conveyance channels. We appreciate the opportunity to assist the citizens of East Baton Rouge Parish by participating in the Amite River and Tributaries study.

We have reviewed the tentatively selected plan included in the East Baton Rouge Parish Flood Control feasibility study and EIS. East Baton Rouge Parish intends to be the local sponsor for the plan. We realize the responsibilities that are incumbent on us, such as the required cash contribution; the acquisition of land, easements, and rights-of-way; and operation, maintenance, and rehabilitation of the project as needed after completion of the initial project construction. The City-Parish Government of East Baton Rouge Parish is authorized by law to engage in cooperative endeavors with the Federal Government, and intends to enter into a binding agreement with the Federal Government at the appropriate time.

Sincerely,

Tom Ed McHugh

Tom Ed McHugh
Mayor-President

TEM:ndb

11ndb.o94

EAST BATON ROUGE PARISH
CORPS OF ENGINEERS' FLOOD CONTROL PROGRAM
FINANCING PLAN AND STATEMENT OF FINANCIAL CAPABILITY

Scope

This document describes the financial plan of East Baton Rouge Parish (the Parish) necessary to meet obligations relative to flood control projects to be undertaken through the cooperative efforts of the U. S. Corps of Engineers (the Corps) and the Parish. It also describes the financial capability of the Parish to meet its obligations under the program.

The Parish endeavors to contract with the Corps to provide various flood control projects as set forth herein. In accordance with such contract, the Parish would provide the necessary non-Federal economic and operational cooperation as specified in a contract between the parties. The estimated financial requirements incumbent on the Parish are set forth herein in **Schedule "A"** and **Schedule "B"**.

Project History and Proposed Improvements

The East Baton Rouge Parish Flood Control Study is one of five studies being conducted by the U.S. Army Corps of Engineers, as part of their Amite River and Tributaries Study. The Amite River and Tributaries Study is being conducted in response to a resolution of the Committee on Public Works of the United States Senate. The resolution, sponsored by the late Senator Allen J. Ellender and Senator Russell B. Long of Louisiana, was adopted on April 14, 1967, and reads as follows:

> "RESOLVED BY THE COMMITTEE ON PUBLIC WORKS OF THE UNITED STATES SENATE, That the Board of Engineers for Rivers and Harbors, created under Section 3 of the River and Harbor Act approved June 13, 1902, be, and is hereby requested to review the report of the Chief of Engineers on Amite River and Tributaries, Louisiana, published as House Document Numbered 419, Eighty-fourth Congress, and other pertinent reports, with a view to determining whether the existing project should be modified in any way at this time with particular reference to additional improvements for flood control and related purposes on Amite River, Bayou Manchac, and Comite River and their tributaries."

The East Baton Rouge Parish Flood Control Study was conducted to develop economically feasible and environmentally acceptable solutions to reduce flood damages associated with headwater and backwater flooding from major drainage streams in East Baton Rouge Parish. Major flood events have occurred in East Baton Rouge Parish in 1953, 1962, 1967, 1973, 1977, 1979, 1983, 1989, 1990, and 1993. This study was initiated in 1987. Economically feasible

solutions have been developed for five (5) watersheds. They are Bayou Fountain, Ward Creek, Jones Creek, Beaver Bayou, and Blackwater Bayou.

Bayou Fountain Watershed

The tentatively selected plan for Bayou Fountain consists of clearing and/or widening approximately eleven (11) miles of existing earthen channel. Proposed modifications are designed to convey a 10-year storm event within streambank and reduce out-of-bank stages for larger storm flood events.

Improvements include clearing and snagging from the bayou's mouth at Bayou Manchac upstream to Burbank Drive and Gardere Lane upstream to Ben Hur Road. The existing channel section between Burbank Drive and Gardere Lane, is proposed to be widened to an earthen channel section having a 50-foot wide bottom with 3:1 bank slopes.

Ward Creek Watershed

The proposed plan for Ward Creek consists of clearing and/or improving approximately fourteen (14) miles of existing earthen channel and concrete lining a section of the North Branch of Ward Creek. Minimal clearing and snagging of the main stem of Ward Creek is proposed from its mouth at Bayou Manchac upstream to its termination just above Corporate Boulevard, excluding the newly enlarged and relocated section between Pecue Lane and Siegen Lane. Also included are proposed improvements to the two main tributaries: Dawson Creek and the North Branch of Ward Creek. Proposed channel improvements for Dawson Creek include clearing and snagging from its mouth with Ward Creek upstream to its confluence with Bayou Duplantier just above Kenilworth Boulevard. The proposed improvements for the North Branch of Ward Creek include concrete lining the existing unlined channel from immediately downstream of I-10 to immediately downstream of I-12 with a design channel section consisting of a 32-foot bottom and 3:1 side slopes. The existing paved section in this reach of approximately 1,250 feet with an established side slope of 2:1 shall remain. The proposed channel improvements and paving on the lower one-third of the North Branch tributary will contain a 25-year storm event and lower flood stages for higher events. The proposed channel clearing and snagging of the main stem to Corporate Boulevard and of Dawson Creek to Bayou Duplantier will, in general, contain slightly less than a 10-year storm event throughout the watershed with the exception of Bayou Duplantier. Flood stages for larger storm events will also be lowered.

Jones Creek Watershed

The tentatively selected plan for the Jones Creek watershed consists of clearing, reshaping, and concrete lining approximately nineteen (19) miles of the main stem of Jones Creek and its four main tributaries - Jones Creek Tributary, Lively Bayou, Lively Bayou Tributary, and Weiner Creek. Clearing and snagging of lower Jones Creek, below Jones Creek Road to the channel's mouth at the Amite River is also included. New channel bank slopes are designed for 3:1 side slopes. Design channel bottom widths are five (5) feet throughout the watershed above Jones Creek Road. No significant changes are proposed to existing channel bottom elevation or

grade. The proposed channel paving will contain in excess of a 25-year storm event and will lower flood stages for larger storm events.

Beaver Bayou Watershed

The tentatively selected plan for the Beaver Bayou watershed consists of widening approximately eight (8) miles of the existing earthen channel of the main stem of Beaver Bayou and its two main tributaries. Also included are proposed improvements to several bridges and culverts. Proposed modifications are designed to convey a 25-year storm event within streambank and reduce out-of-bank stages for larger storm flood events. Because of soil conditions, the proposed channel bank side slopes will be 3.5H:1.0V. Design bottom widths vary per stream reach. No significant changes are proposed to existing channel bottom elevation or grade.

Blackwater Bayou Watershed

The tentatively selected plan for the Blackwater Bayou watershed consists of widening approximately thirteen (13) miles of the existing earthen channel of the main stem of Blackwater Bayou and its main tributary. Also included are proposed improvements to several bridges and culverts. Proposed modifications are designed to convey a 10-year storm event within streambank and reduce out-of-bank stages for larger storm flood events. Proposed channel bank side slopes will be 3.5H:1.0V. Design bottom widths vary per stream reach. No significant changes are proposed to existing channel bottom elevation or grade.

Operation and Maintenance

The required Operation and Maintenance (O&M) for the proposed channel improvements consists of continuous inspection and debris removal, annual herbicide application, and concrete lining repairs where necessary. Clearing and snagging will be performed every 5 to 10 years, as needed. Herbicide application would be conducted in accordance with Environmental Protection Agency guidelines. Maintenance of the recommended combined project mitigation areas for the tentatively selected plans would include protection of the land and plantings to achieve the habitat value projected.

Mitigation Plan

The proposed mitigation plan consists of acquisition and development of bottomland hardwood habitat upon approximately 400 acres of land in East Baton Rouge Parish. This would be made up of the combined 115 acres of lands adjacent to or nearby a BREC park and would include the balance of 282 acres of lands off Joor Road. Locating mitigation sites in the Baton Rouge metropolitan area and adjacent to these public parks will provide the opportunity for some public interaction and enjoyment of the areas. Such interaction can be accomplished by means of suitably designed nature trails.

Operation and Maintenance (O&M) would be the responsibility of the City-Parish. The Recreation and Parks Commission for the Parish of East Baton Rouge (BREC) has indicated an interest and willingness to assume responsibility of the day-to-day operation and maintenance of the mitigation areas.

It was determined that combining the mitigation needs of the above five (5) tentatively selected watershed plans and developing an integrated mitigation plan was far more practical than developing a separate plan for each. Significant cost savings can be realized by acquiring and developing a minimum number of sites with their total combined acreage mitigating combined needs as opposed to acquiring and developing five (5) separate sites.

Financing Plan and Financial Capability

The Parish has a number of options for funding the flood control program. Presented below is an assessment of funding requirements and several potential funding sources.

Funding Requirements

The Parish will be required to provide specified amounts during the period of construction. Estimates of such amounts are set forth in the "Schedule of Federal and Non-Federal Costs", **Schedule "A"** and **Schedule "B"**. The total construction costs to be allocated to the projects by the Corps are currently estimated at $109,100,000, stated in 1994 dollars. The total obligations of the Parish for the years 1997 through 2006 are estimated to be $36,000,000 for construction and $2,194,000 for operation and maintenance costs. These figures include adjustments for inflation to compensate for the time that will elapse between 1994 and the year of construction. The construction of these projects is expected to begin in 1997 and to be completed in 2006.

Ad Valorem Taxes

The Parish has a stable and rather constant ad valorem tax base. Each parishwide mill generated approximately $1,075,000 in net tax dollars in 1993. A mill can be expected to produce about $1,120,000 in 1997, assuming a growth rate of 1% per year. A review of historical collections indicates an average growth rate assumption of 1% is reasonable. Qualifying property would be eligible for a homestead exemption, resulting in the first $75,000 of value being exempt from the tax. Voter approval would be required to obtain authorization to levy the ad valorem tax. Providing the non-Federal share of costs for the projects on a pay-as-you-go basis would require a 4.12 mill tax for the years 1997 through 2004 based on current estimated costs. Levying the tax one year in advance of the time cash outlays are required will eliminate most of the problems associated with cash flows derived from ad valorem taxes. With such taxes, the levy occurs in one year, while most of the cash is received early in the next year. **Schedule "C"** illustrates financing the program with ad valorem tax proceeds on a pay-as-you-go basis.

If the Parish ad valorem tax is funded into 25 year bonds, a much smaller number of mills would be required. **Schedule "D"** illustrates financing the program with ad valorem tax proceeds funded into bonds.

Sales and Use Taxes Dedicated for Capital Improvements

A one-half of one percent (1/2%) sales and use tax is currently being levied for the purpose of providing street improvements in the Parish. The voters reauthorized this tax on April 3, 1993, for a four year period ending June 30, 1997.

With voter approval, this tax could be extended and a portion redirected to provide for drainage improvements. It should generate about $21.0 million in 1995. Assuming a 3% growth rate per year, which is consistent with the long-term projection of sales and use taxes for other capital improvement purposes, this tax should generate about $22.3 million in 1997. The requirements of the proposed flood control program will utilize a varying percentage of the proceeds from the tax. **Schedule "E"** illustrates financing the program with sales tax proceeds on a pay-as-you-go basis. As indicated on this schedule, the Parish could provide an amount, which when combined with interest earned on idle monies as shown on **Schedule "F"**, would fund the program by 1999.

Should the Parish decide to leverage the proceeds of the tax by selling bonds, a far smaller percentage of the tax will be needed to service the debt on the bonds, as opposed to funding the construction out of sales tax revenues on a pay-as-you-go basis. Generally speaking, level annual debt service on bonds equals approximately 9.4% of the debt issued, when issuing debt for 25 years at 8%. The tax would have to be levied for a period of about 35 years, if 25 year debt is issued on an annual basis for 10 years. **Schedule "G"** illustrates financing the program by bonding sales tax proceeds.

Bond and Legal Capacity

The Parish is very capable of issuing bonds supported by the 1/2% sales tax in an amount sufficient to fund the flood control program. It enjoys favorable bond ratings, has sufficient bond capacity, has the legal authority to contract with the Corps for the proposed project, and has the legal authority to levy taxes and issue debt for this purpose. These facts are evidenced in correspondence from the Parish's financial advisor and bond counsel, which are included herein.

CitiState Advisors
Incorporated

August 31, 1993

Colonel Michael Diffley
District Engineer
U.S. Army Corps of Engineers
P.O. Box 60267
New Orleans, LA 70160-0267

Re: ***Corps of Engineers Flood Control Program --***
East Baton Rouge Parish Projects

Dear Colonel Diffley:

We act as financial advisor to the Consolidated Government of the City of Baton Rouge and the Parish of East Baton Rouge, Louisiana, (the "City/Parish") in connection with all bond issues of the City/Parish. We have participated with the City/Parish administration, bond counsel and other professionals in budget planning for both current and capital expenditures as required by the Plan of Government governing the City/Parish. We have participated in the Comprehensive Land Use Plan (the "Horizon Plan") process mandated by the voters which resulted in a comprehensive capital plan addressing multiple categories of need and financing alternatives for funding.

The City/Parish is an active issuer of debt. The attached schedule lists the principal amount, source of security and ratings for debt issued by the City/Parish in the most recent five year period. During the period, the City/Parish continued to maintain active and excellent relationships with credit market participants, including the three major rating agencies, the four largest municipal insurers and major regional and national underwriting firms.

During the same period, the City/Parish obtained voter and regulatory approval for sales taxes for several capital purposes.

We have been asked to advise you of the capability of the Parish of East Baton Rouge, State of Louisiana (the "Parish") to finance certain flood control projects set forth in the Financing Plan prepared in connection with the Corps of Engineers' Flood Control Program submitted this date by the Parish (the "Financing Plan"). Based on the recent experience of the City/Parish in the financial markets and on our understanding of those market conditions relevant to the Financing Plan as they exist today, we are of the opinion that the Parish has the capability of issuing and selling debt in the manner set forth in the Financing Plan.

Respectfully Submitted,

CitiState Advisors Incorporated

By: [signature]
Robert B. Phelps
Managing Director

cc: Mayor McHugh
Don Nijoka
O. Lynn Schofield

Four United Plaza, Suite 402 • 8555 United Plaza Boulevard • Baton Rouge, LA 70809
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CITY OF BATON ROUGE – PARISH OF EAST BATON ROUGE
SCHEDULE OF DEBT ISSUED DURING THE YEARS 1989 THROUGH 1993

ISSUER	DATED	PRINCIPAL ISSUED	SOURCE OF SECURITY	RATINGS: STANDARD & POOR'S	RATINGS: MOODY'S INVESTORS	RATINGS: FITCH'S INVESTORS	INSURED
Parish of East Baton Rouge	02/01/89	45,000,000	Net revenues from the Issuer's one–half of one percent (1/2%) sales and use tax	AAA	Aaa	N/A	Yes
Parish of East Baton Rouge	08/01/89	6,625,000	Net revenues from the Issuer's two percent (2%) sales and use tax	AAA	Aaa	N/A	Yes
City of Baton Rouge	08/01/89	14,340,000	Net revenues from the Issuer's two percent (2%) sales and use tax	AAA	Aaa	N/A	Yes
City of Baton Rouge	12/01/90	5,000,000	Net revenues from the Issuer's two percent (2%) sales and use tax	AAA	Aaa	N/A	Yes
Parish of East Baton Rouge	08/01/91	20,000,000	Net revenues from the Issuer's one–half of one percent (1/2%) sales and use tax	AAA	Aaa	N/A	Yes
City of Baton Rouge	02/01/92	21,400,000	Net revenues from the Issuer's two percent (2%) sales and use tax	AAA	Aaa	N/A	Yes
City of Baton Rouge	04/01/92	85,000,000	Net revenues from the Issuer's two percent (2%) sales and use tax	AAA	Aaa	N/A	Yes
Parish of East Baton Rouge	03/01/93	30,200,000	Net revenues from the Issuer's one–half of one percent (1/2%) sales and use tax	A AAA	Baa1 Aaa	A N/A	No Yes

BONDS/ISSUED
01-Sep-93

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August 27, 1993

Colonel Michael Diffley
District Engineer
U.S. Army Corps of Engineers
P. O. Box 60267
New Orleans, Louisiana 70160-0267

RE: Corps of Engineers Flood Control Program -- East Baton Rouge Parish Projects

Dear Colonel Diffley:

We act as bond counsel to the Consolidated Government of the City of Baton Rouge and Parish of East Baton Rouge, Louisiana (the "City/Parish"), in connection with all bond issues of the City/Parish and other related public finance matters. In such capacity, we have been requested to advise you of the capability of the Parish of East Baton Rouge, State of Louisiana (the "Parish"), to finance the flood control projects set forth in the Financing Plan relative to the Corps of Engineers Flood Control Program submitted this date by the Parish.

We have examined the provisions of the Louisiana Constitution of 1974 (the "Constitution") and statutes of the State of Louisiana, and such other documents and matters of law as we have deemed necessary or appropriate for the purposes herein.

On the basis of the foregoing examinations, we are of the view as of the date hereof and under existing law, as follows:

1. La. R.S. 39:698.1 authorizes a local governmental subdivision to fund sales tax revenues into negotiable bonds provided that the question of or proposition to authorize the funding of sales tax

revenues into bonds shall have been submitted to the electors of the local governmental subdivision.

2. La. R.S. 39:702 authorizes a political subdivision to call a special election for the purpose of submitting to the property taxpayers a proposition to levy a special tax and whether such special taxes may be funded into bonds. This ad valorem tax is generally referred to as a limited tax. The limited tax obligation bonds may be used for flood control purposes.

3. Article VI, Section 33 of the Louisiana Constitution of 1974, and La. R.S. 39:551, et seq. provides for the issuance of general obligation bonds backed by and based on ad valorem taxes (unlimited taxes). Such bonds may be used for flood control purposes.

4. Article VI, Section 32 of the Louisiana Constitution of 1974 provides that for the purpose of acquiring, constructing, improving, maintaining or operating any work or public improvement, a political subdivision may levy special taxes when authorized by a majority of the electors in the political subdivision who vote thereon in an election held for that purpose. In addition, La. R.S. 39:801 authorizes a political subdivision to submit to the property taxpayers a proposition to levy a special tax for the purpose of constructing or improving any work of public improvement. A sales tax is authorized to be collected in accordance with Article VI, Section 29 of the Louisiana Constitution of 1974.

5. Article VI, Section 20 of the Louisiana Constitution of 1974 provides that a political subdivision may exercise and perform any authorized power and function, including financing, jointly or in cooperation with one or more political subdivisions, either within or without the state, or with the United States or its agencies.

The information set forth herein is specifically limited to the laws of the State of Louisiana and of the United States of America.

Respectfully Submitted,

BREAZEALE, SACHSE & WILSON, L.L.P.

BY: ______________________
Richard D. Leibowitz

RDL:mmh

Corps Of Engineers' Flood Control Program
East Baton Rouge Parish Projects
Schedule Of Federal And Non-Federal Costs
With Costs Stated In 1994 Dollars

SCHEDULE "A"

Fiscal Year	Total Project Cost	Federal Construction Share	Non-Federal Construction Share
1995	742,000	742,000	0
1996	734,000	734,000	0
1997	1,517,000	769,000	748,000
1998	2,872,000	2,114,000	758,000
1999	2,744,000	2,098,000	646,000
2000	2,741,000	2,055,000	686,000
2001	12,584,000	9,345,000	3,239,000
2002	19,491,000	13,671,000	5,820,000
2003	26,154,000	20,500,000	5,654,000
2004	28,771,000	21,493,000	7,278,000
2005	10,750,000	7,979,000	2,771,000
2006	0	0	0
Total	109,100,000	81,500,000	27,600,000

Range Name: 1994 Dollars

10/10/94

Corps Of Engineers' Flood Control Program
East Baton Rouge Parish Projects
Schedule Of Federal And Non-Federal Costs
With Inflated Costs Fully Funded

SCHEDULE "B"

Fiscal Year	Total Project Cost	Federal Construction Share	Non-Federal Construction Share	Non-Federal O & M Costs
1995	774,000	774,000	0	0
1996	797,000	797,000	0	0
1997	1,719,000	896,000	823,000	0
1998	3,337,000	2,446,000	891,000	42,000
1999	3,300,000	2,532,000	768,000	84,000
2000	3,386,000	2,540,000	846,000	130,000
2001	15,797,000	11,681,000	4,116,000	180,000
2002	25,182,000	17,549,000	7,633,000	232,000
2003	34,509,000	27,238,000	7,271,000	288,000
2004	39,116,000	29,308,000	9,808,000	348,000
2005	15,083,000	11,239,000	3,844,000	411,000
2006	0	0	0	479,000
Total	143,000,000	107,000,000	36,000,000	2,194,000

Range Name: Costs

10/10/94

Corps Of Engineers' Flood Control Program
East Baton Rouge Parish Projects
Financing Plan 1997 - 2006

SCHEDULE "C"

Based On Ad Valorem Tax Revenues

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Totals
Revenues											
Ad Valorem Tax - 1 Mill (1% Inflation)	1,120,000	1,131,200	1,142,512	1,153,937	1,165,476	1,177,131	1,188,903	1,200,792	1,212,800	1,224,928	
Times Number of Mills Levied	4.12	4.12	4.12	4.12	4.12	4.12	4.12	4.12	0.00	0.00	
Total Ad Valorem Tax Generated	4,614,400	4,660,544	4,707,149	4,754,221	4,801,763	4,849,781	4,898,279	4,947,261	0	0	38,233,398
Expenditures											
Construction	823,000	891,000	768,000	846,000	4,116,000	7,633,000	7,271,000	9,808,000	3,844,000	0	36,000,000
Maintenance	0	42,000	84,000	130,000	180,000	232,000	288,000	348,000	411,000	479,000	2,194,000
Total Expenditures	823,000	933,000	852,000	976,000	4,296,000	7,865,000	7,559,000	10,156,000	4,255,000	479,000	38,194,000
Annual Balance	3,791,400	3,727,544	3,855,149	3,778,221	505,763	(3,015,219)	(2,660,721)	(5,208,739)	(4,255,000)	(479,000)	39,398
Cumulative Balance	3,791,400	7,518,944	11,374,093	15,152,314	15,658,078	12,642,858	9,982,137	4,773,398	518,398	39,398	

Range Name: Advalorem

Corps Of Engineers' Flood Control Program
East Baton Rouge Parish Projects
Financing Plan 1997 - 2006

SCHEDULE "D"

Based On Bonded Ad Valorem Tax Revenues

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Totals
Revenues											
Ad Valorem Tax - 1 Mill (1% Inflation)	1,120,000	1,131,200	1,142,512	1,153,937	1,165,476	1,177,131	1,188,903	1,200,792	1,212,800	1,224,928	
Times Number of Mills Levied	0.08	0.19	0.29	0.39	0.77	1.43	2.05	2.86	3.18	3.20	
Total Ad Valorem Tax Generated	89,600	214,928	331,328	450,035	897,417	1,683,298	2,437,250	3,434,264	3,856,702	3,919,768	17,314,591
Bond Proceeds	839,460	908,820	783,360	862,920	4,198,320	7,785,660	7,416,420	10,004,160	3,920,880	0	36,720,000
Expenditures											
Construction	823,000	891,000	768,000	846,000	4,116,000	7,633,000	7,271,000	9,808,000	3,844,000	0	36,000,000
Bond Obligations											
Annual Debt Service At 8% For 25 Years	78,640	163,777	237,161	317,998	711,292	1,440,643	2,135,404	3,072,582	3,439,885	3,439,885	15,037,265
Issuance Cost	16,789	18,176	15,667	17,258	83,966	155,713	148,328	200,083	78,418	0	734,400
Maintenance	0	42,000	84,000	130,000	180,000	232,000	288,000	348,000	411,000	479,000	2,194,000
Total Expenditures	918,429	1,114,953	1,104,828	1,311,257	5,091,258	9,461,356	9,842,732	13,428,665	7,773,302	3,918,885	53,965,665
Annual Balance	10,631	8,795	9,860	1,699	4,479	7,602	10,938	9,759	4,280	883	68,926
Cumulative Balance	10,631	19,426	29,286	30,985	35,464	43,066	54,004	63,763	68,043	68,926	
Cumulative Bond Proceeds	839,460	1,748,280	2,531,640	3,394,560	7,592,880	15,378,540	22,794,960	32,799,120	36,720,000	36,720,000	

Range Name: Advalorem Bonds

Note: Separate millages would be required for debt service (variable) and O & M expenses (fixed).

Corps Of Engineers' Flood Control Program
East Baton Rouge Parish Projects
Financing Plan 1997 - 2006

SCHEDULE "E"

Based On Sales Tax Revenues

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Totals
Revenues											
One-Half Percent Sales Tax (3% Inflation)	22,278,900	22,947,267	23,635,685	0	0	0	0	0	0	0	
Portion of Tax Utilized	0.038	0.697	0.762	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Total Sales Tax Utilized	850,000	16,000,000	18,000,000	0	0	0	0	0	0	0	34,850,000
Interest Income	(24,690)	(27,921)	425,682	949,172	848,767	638,280	430,659	138,898	15,415	1,508	3,395,770
Expenditures											
Construction	823,000	891,000	768,000	846,000	4,116,000	7,633,000	7,271,000	9,808,000	3,844,000	0	36,000,000
Maintenance	0	42,000	84,000	130,000	180,000	232,000	288,000	348,000	411,000	479,000	2,194,000
Total Expenditures	823,000	933,000	852,000	976,000	4,296,000	7,865,000	7,559,000	10,156,000	4,255,000	479,000	38,194,000
Annual Balance	2,310	15,039,079	17,573,682	(26,828)	(3,447,233)	(7,226,720)	(7,128,341)	(10,017,102)	(4,239,585)	(477,492)	51,770
Cumulative Balance	2,310	15,041,389	32,615,071	32,588,243	29,141,010	21,914,290	14,785,949	4,768,847	529,262	51,770	

Range Name: Salestax

Corps of Engineers' Flood Control Program
Schedule Of Funding And Cash Draws
Using Inflated Costs
Based On Sales Tax Revenues

SCHEDULE "F"

Fiscal Year	Non-Federal Share	Tax Provided	3% Interest Earnings	Balance
1995	0	0	0	0
1996	0	0	0	0
1997	823,000	850,000	(24,690)	2,310
1998	933,000	16,000,000	(27,921)	15,041,389
1999	852,000	18,000,000	425,682	32,615,071
2000	976,000		949,172	32,588,243
2001	4,296,000		848,767	29,141,010
2002	7,865,000		638,280	21,914,291
2003	7,559,000		430,659	14,785,949
2004	10,156,000		138,898	4,768,848
2005	4,255,000		15,415	529,263
2006	479,000		1,508	51,771
	38,194,000	34,850,000	3,395,771	

Assumptions

Interest is computed on the prior year ending balance, less the non-federal share in the current year.

This means the tax collected in a year is not available for investment until the last day of the year.

Also, all expenditures for a year are projected to occur on the first day of the year.

Interest earnings will occur at the rate of 3%.

Range Name: Horopt5

Corps Of Engineers' Flood Control Program
East Baton Rouge Parish Projects
Financing Plan 1997 - 2006

SCHEDULE "G"

Based On Bonded Sales Tax Revenues

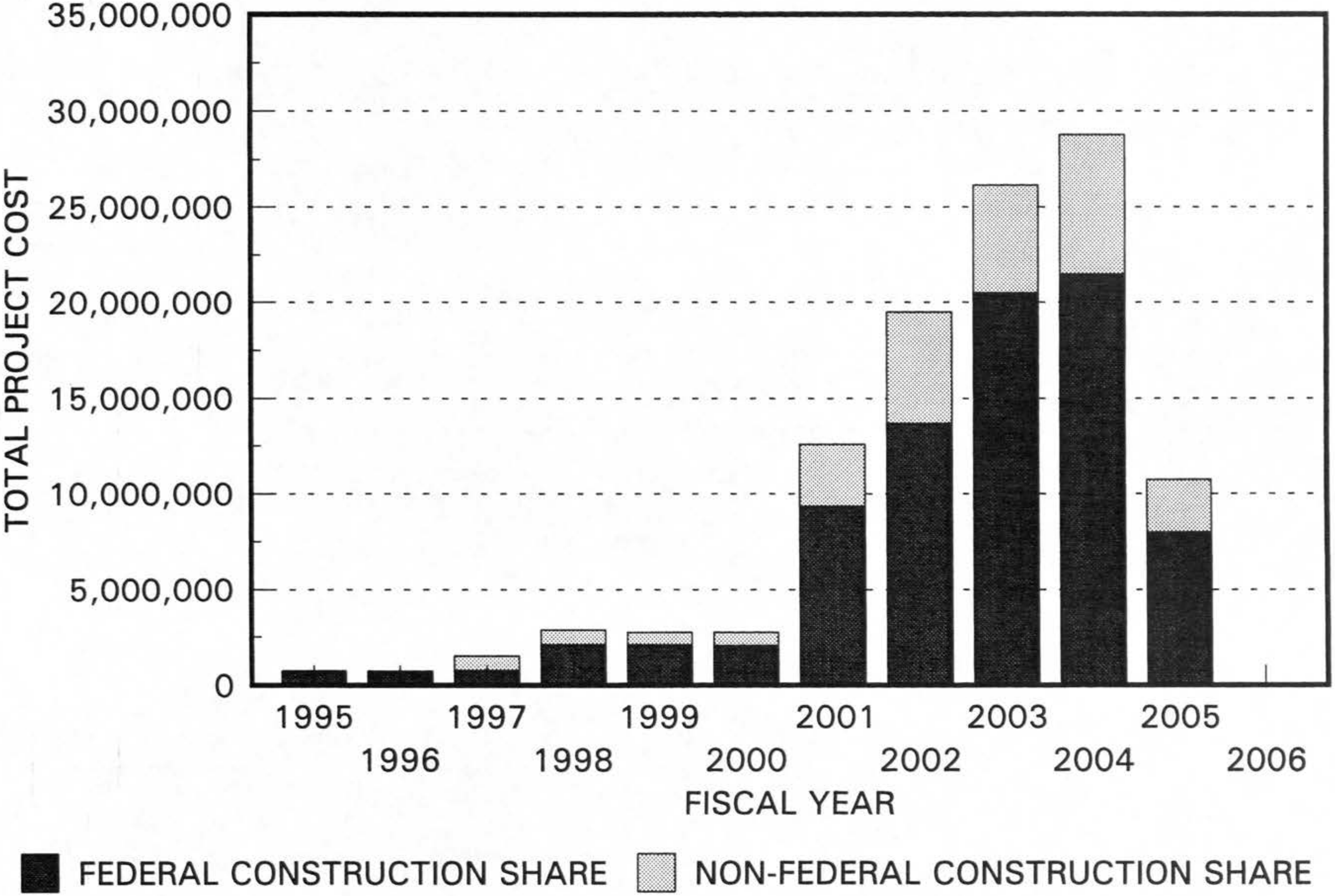
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Totals
Revenues											
One-Half Percent Sales Tax (3% Inflation)	22,278,900	22,947,267	23,635,685	24,344,756	25,075,098	25,827,351	26,602,172	27,400,237	28,222,244	29,068,911	
Portion of Tax Utilized	0.005	0.011	0.014	0.020	0.041	0.075	0.103	0.141	0.150	0.146	
Total Sales Tax Utilized	111,395	252,420	330,900	486,895	1,028,079	1,937,051	2,740,024	3,863,433	4,233,337	4,244,061	19,227,594
Bond Proceeds	921,760	997,920	860,160	947,520	4,609,920	8,548,960	8,143,520	10,984,960	4,305,280	0	40,320,000
Expenditures											
Construction	823,000	891,000	768,000	846,000	4,116,000	7,633,000	7,271,000	9,808,000	3,844,000	0	36,000,000
Bond Obligations											
Annual Debt Service At 8% For 25 Years	86,349	179,833	260,412	349,175	781,026	1,581,882	2,344,757	3,373,815	3,777,128	3,777,128	16,511,507
Reserve Fund	92,176	99,792	86,016	94,752	460,992	854,896	814,352	1,098,496	430,528	0	4,032,000
Issuance Cost	18,435	19,958	17,203	18,950	92,198	170,979	162,870	219,699	86,106	0	806,400
Maintenance	0	42,000	84,000	130,000	180,000	232,000	288,000	348,000	411,000	479,000	2,194,000
Total Expenditures	1,019,961	1,232,584	1,215,631	1,438,877	5,630,217	10,472,758	10,880,980	14,848,010	8,548,762	4,256,128	59,543,907
Annual Balance	13,194	17,756	(24,572)	(4,462)	7,782	13,254	2,564	383	(10,145)	(12,067)	3,687
Cumulative Balance	13,194	30,950	6,379	1,917	9,699	22,953	25,517	25,900	15,755	3,687	
Cumulative Bond Proceeds	921,760	1,919,680	2,779,840	3,727,360	8,337,280	16,886,240	25,029,760	36,014,720	40,320,000	40,320,000	
Coverage Calculations											
One-Half Percent Sales Tax (3% Inflation)	22,278,900	22,947,267	23,635,685	24,344,756	25,075,098	25,827,351	26,602,172	27,400,237	28,222,244	29,068,911	
Percentage of Tax Pledged	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	
Amount of Tax Pledged	4,455,780	4,589,453	4,727,137	4,868,951	5,015,020	5,165,470	5,320,434	5,480,047	5,644,449	5,813,782	
Issuance Test											
Sales Tax Pledged	4,455,780	4,589,453	4,727,137	4,868,951	5,015,020	5,165,470	5,320,434	5,480,047	5,644,449	5,813,782	
Debt Service	86,349	179,833	260,412	349,175	781,026	1,581,882	2,344,757	3,373,815	3,777,128	3,777,128	
Coverage % (Minimum 133%)	5,160	2,552	1,815	1,394	642	327	227	162	149	154	
Parity Test											
Sales Tax Pledged (Prior Two Year's Avg)	N/A	4,455,780	4,522,617	4,658,295	4,798,044	4,941,985	5,090,245	5,242,952	5,400,241	5,562,248	
Debt Service	N/A	179,833	260,412	349,175	781,026	1,581,882	2,344,757	3,373,815	3,777,128	3,777,128	
Coverage % (Minimum 140%)	N/A	2,478	1,737	1,334	614	312	217	155	143	147	

Range Name: Sales Tax Bonds

10/12/94

Graph 1

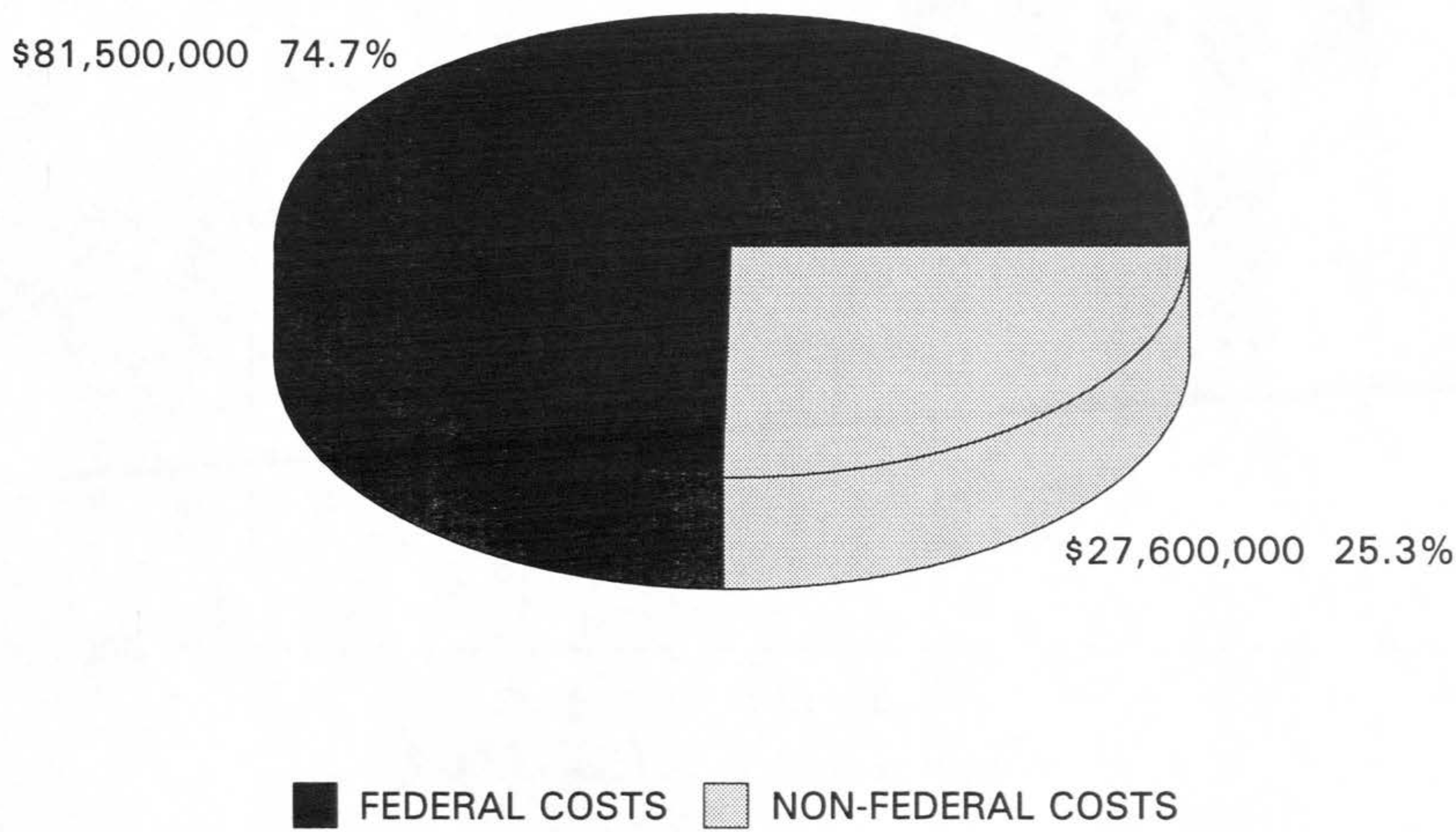
FEDERAL AND NON-FEDERAL COSTS IN 1994 DOLLARS



Graph 2

TOTAL PROJECT COSTS IN 1994 DOLLARS

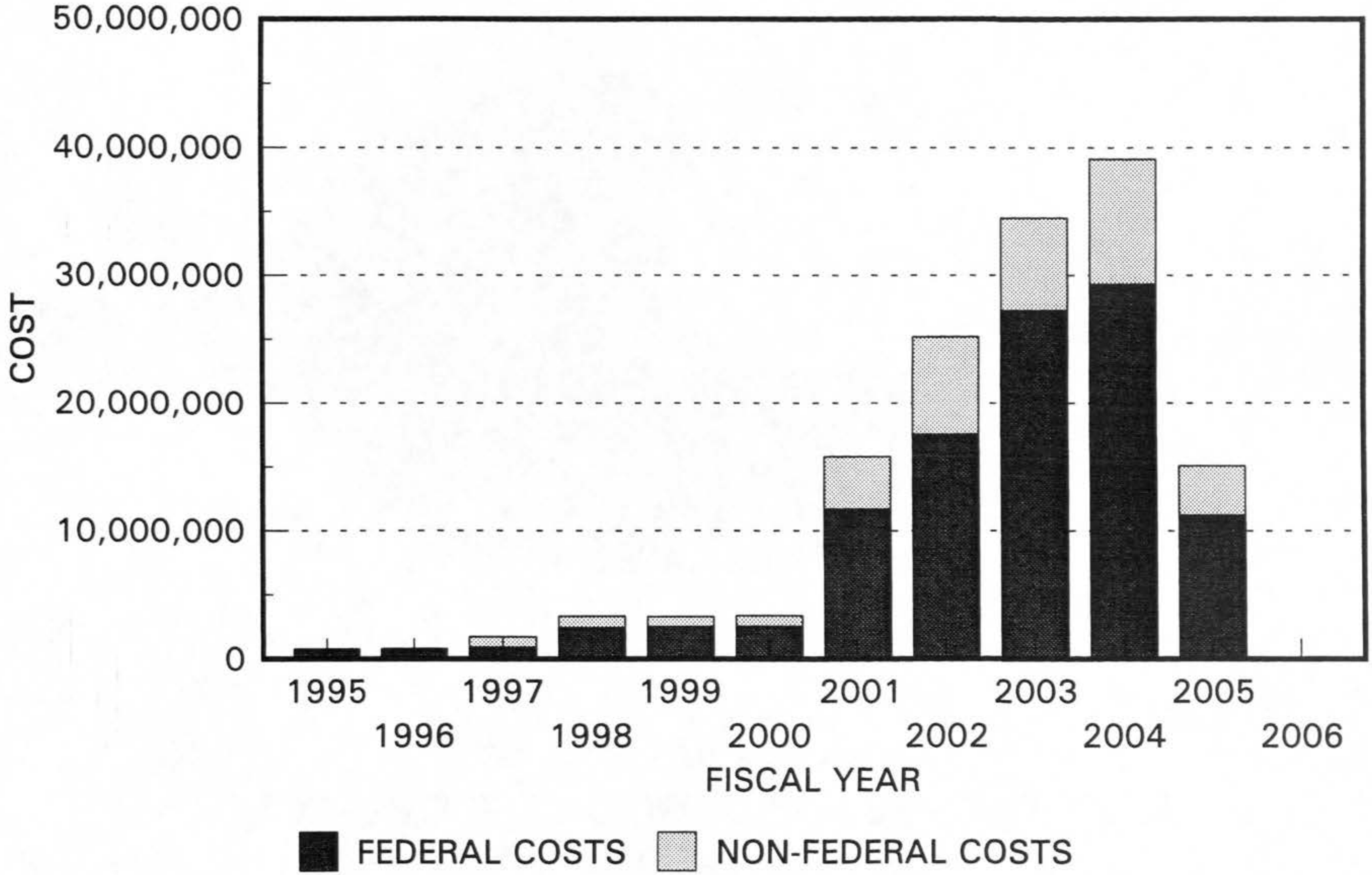
FEDERAL VS. NON-FEDERAL



Graph 3

INFLATED COSTS FULLY FUNDED

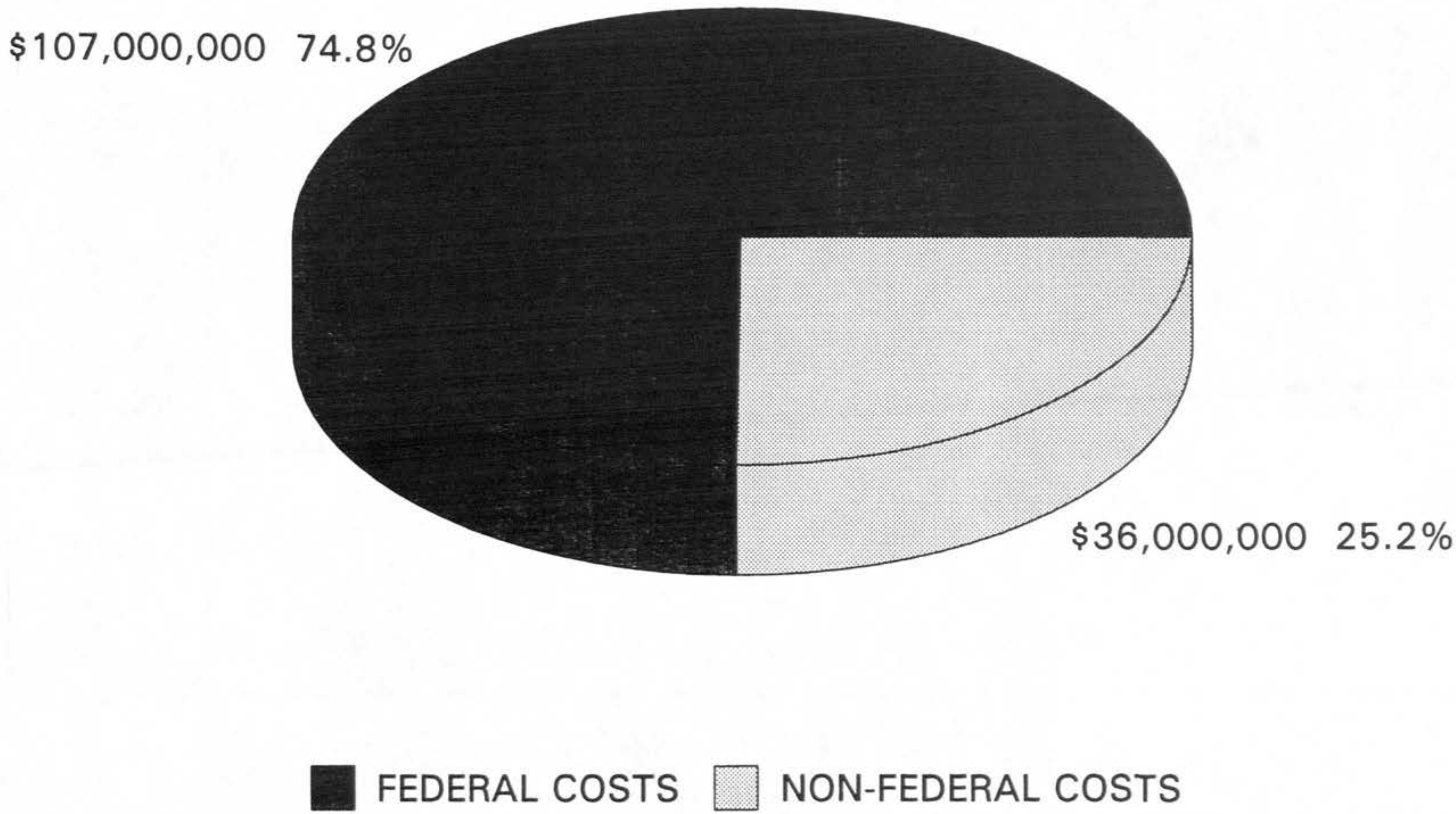
FEDERAL VS. NON-FEDERAL



Graph 4

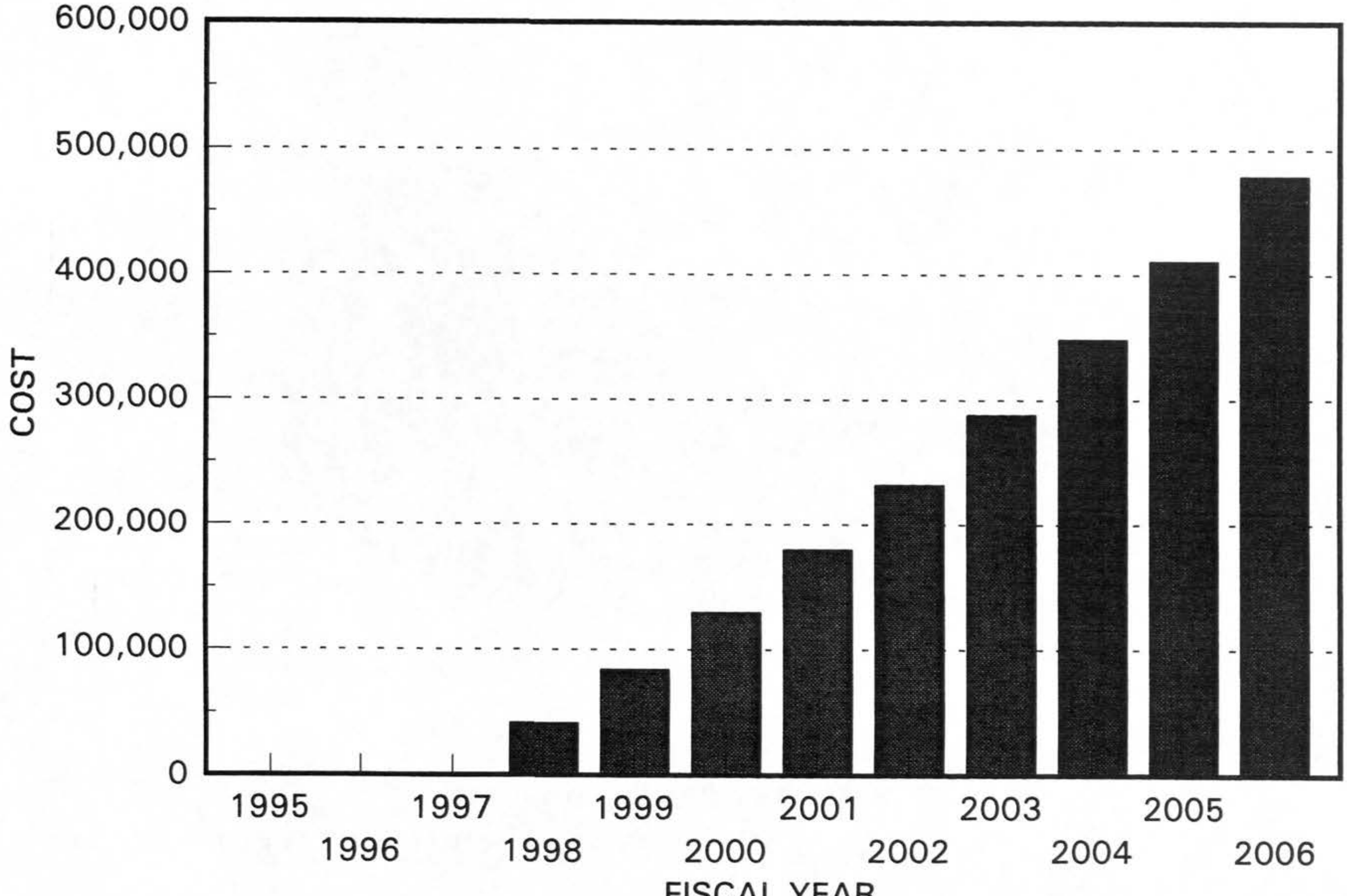
TOTAL INFLATED COSTS FULLY FUNDED

FEDERAL VS. NON-FEDERAL



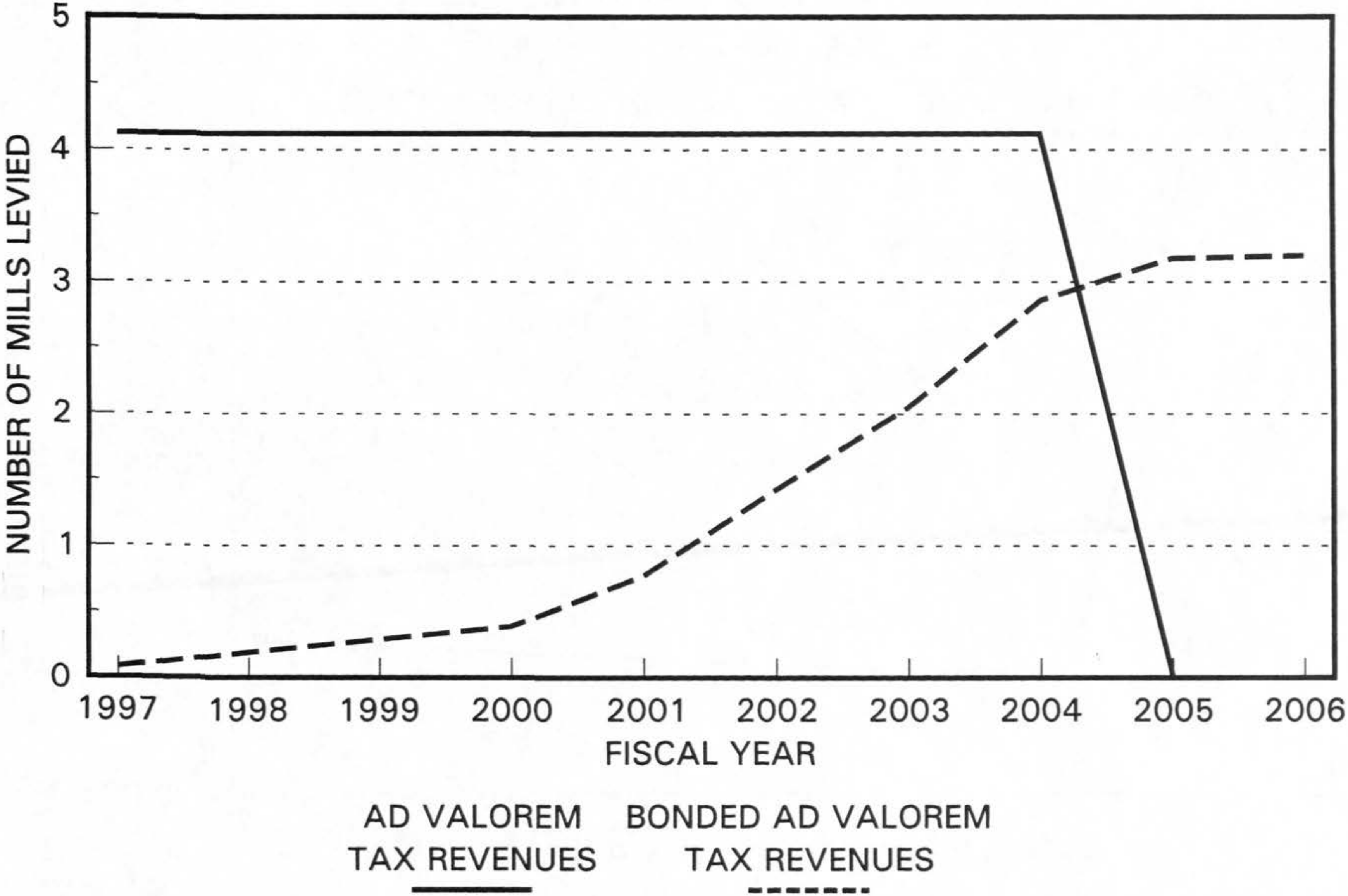
Graph 5

NON-FEDERAL O & M COSTS

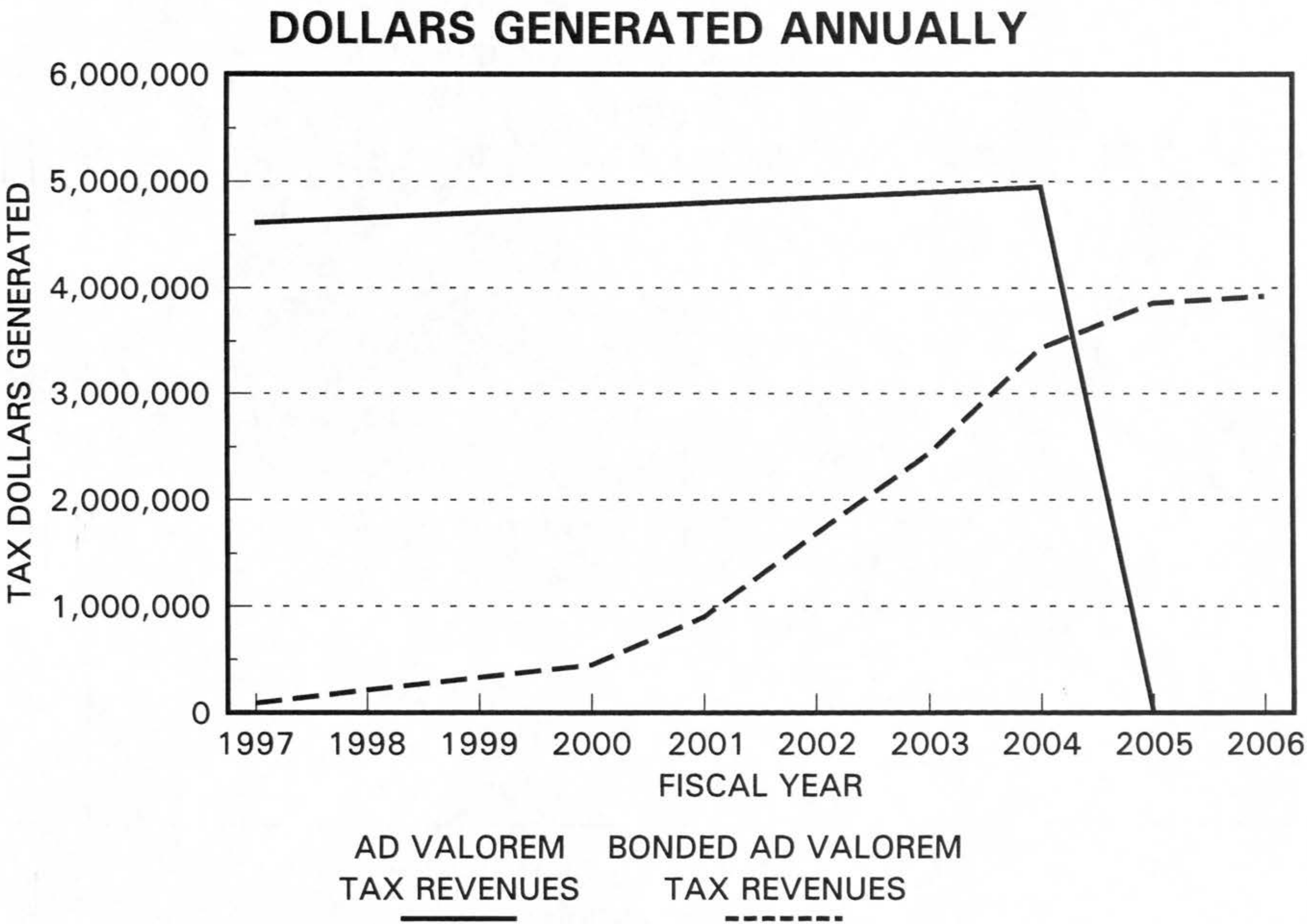


Graph 6

NUMBER OF MILLS LEVIED



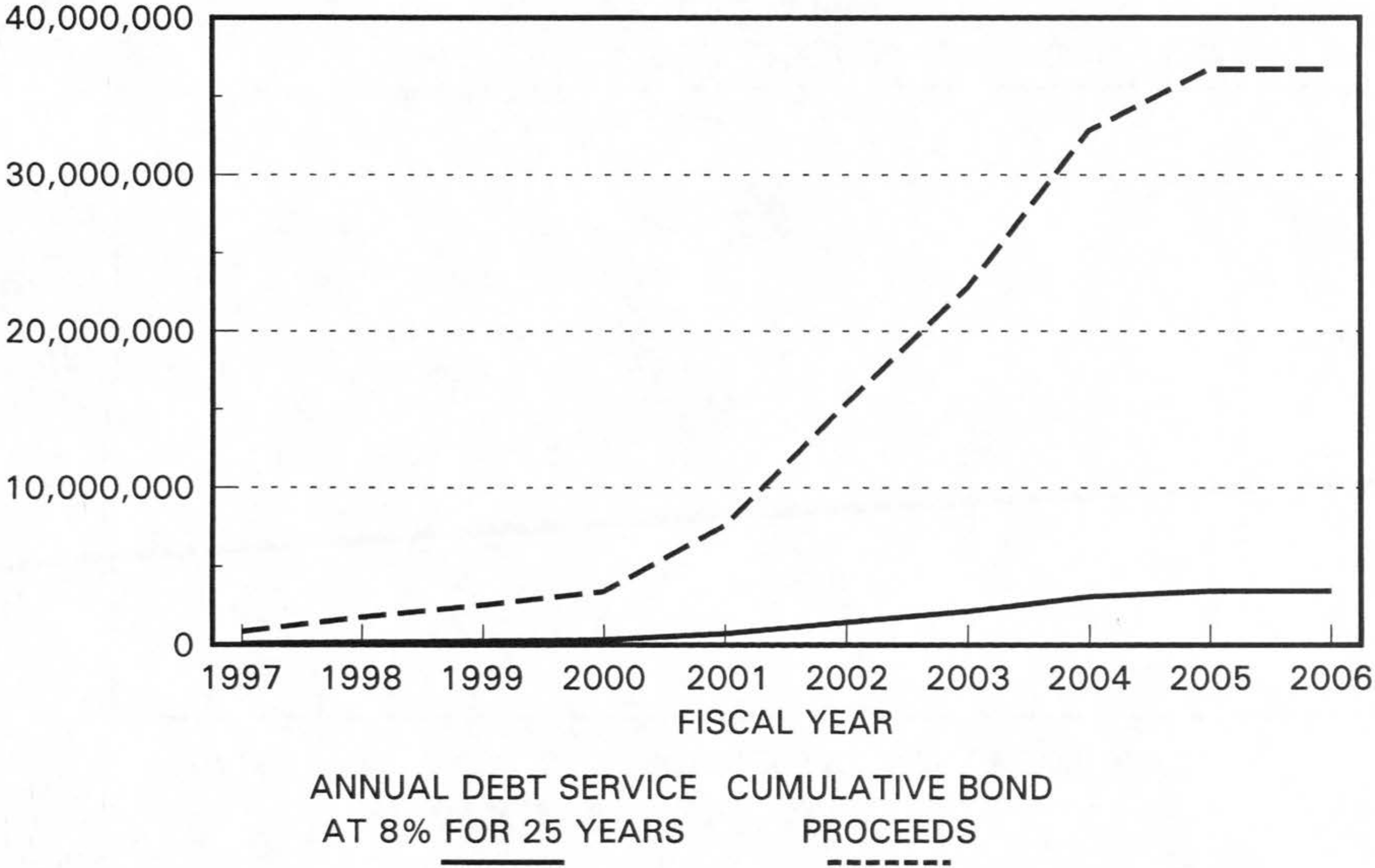
Graph 7


DOLLARS GENERATED ANNUALLY
TAX DOLLARS GENERATED
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
FISCAL YEAR
AD VALOREM TAX REVENUES
BONDED AD VALOREM TAX REVENUES

Graph 8

BONDED AD VALOREM TAX REVENUES

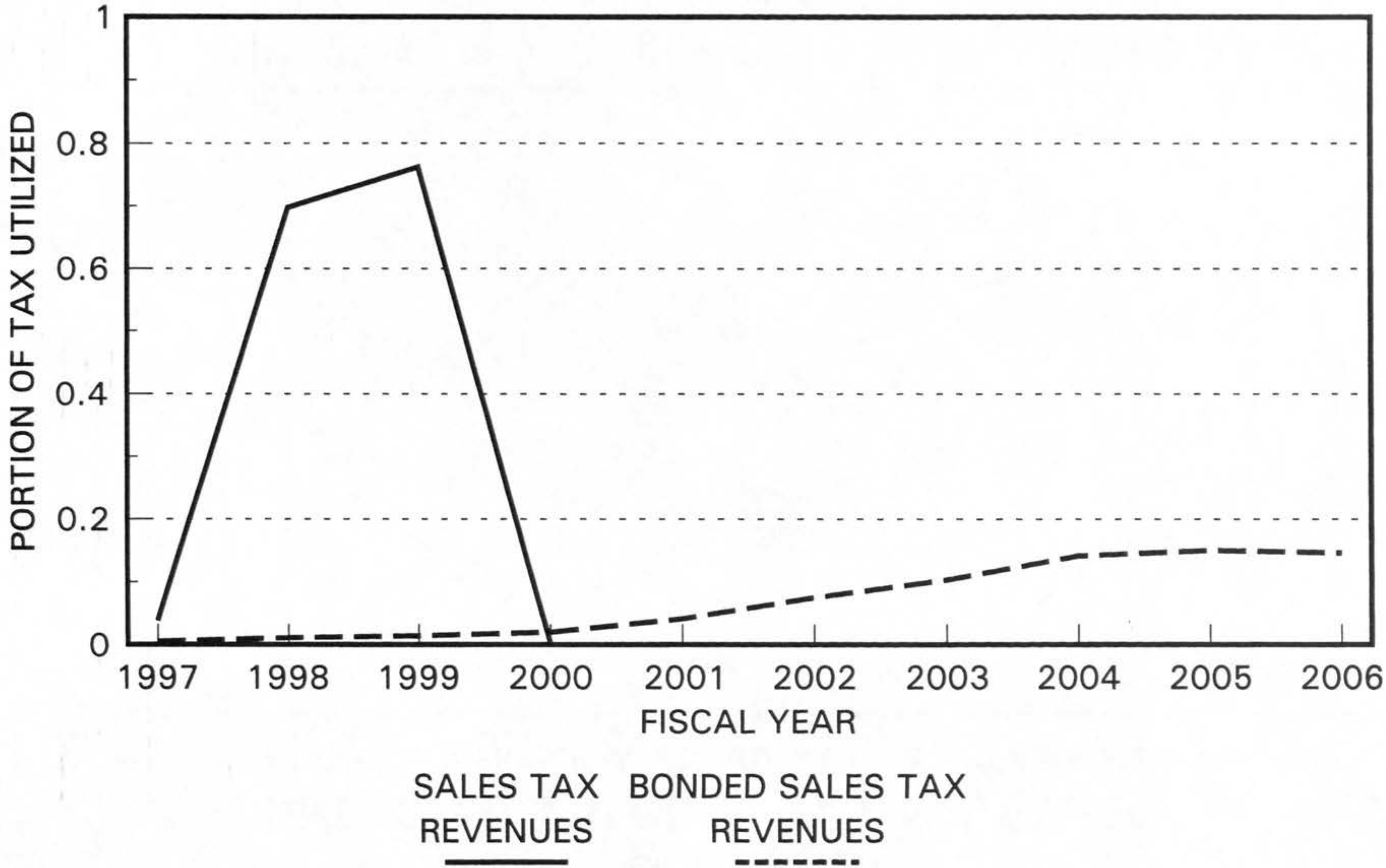
ANNUAL DEBT SERVICE VS. CUMULATIVE BOND PROCEEDS



Graph 9

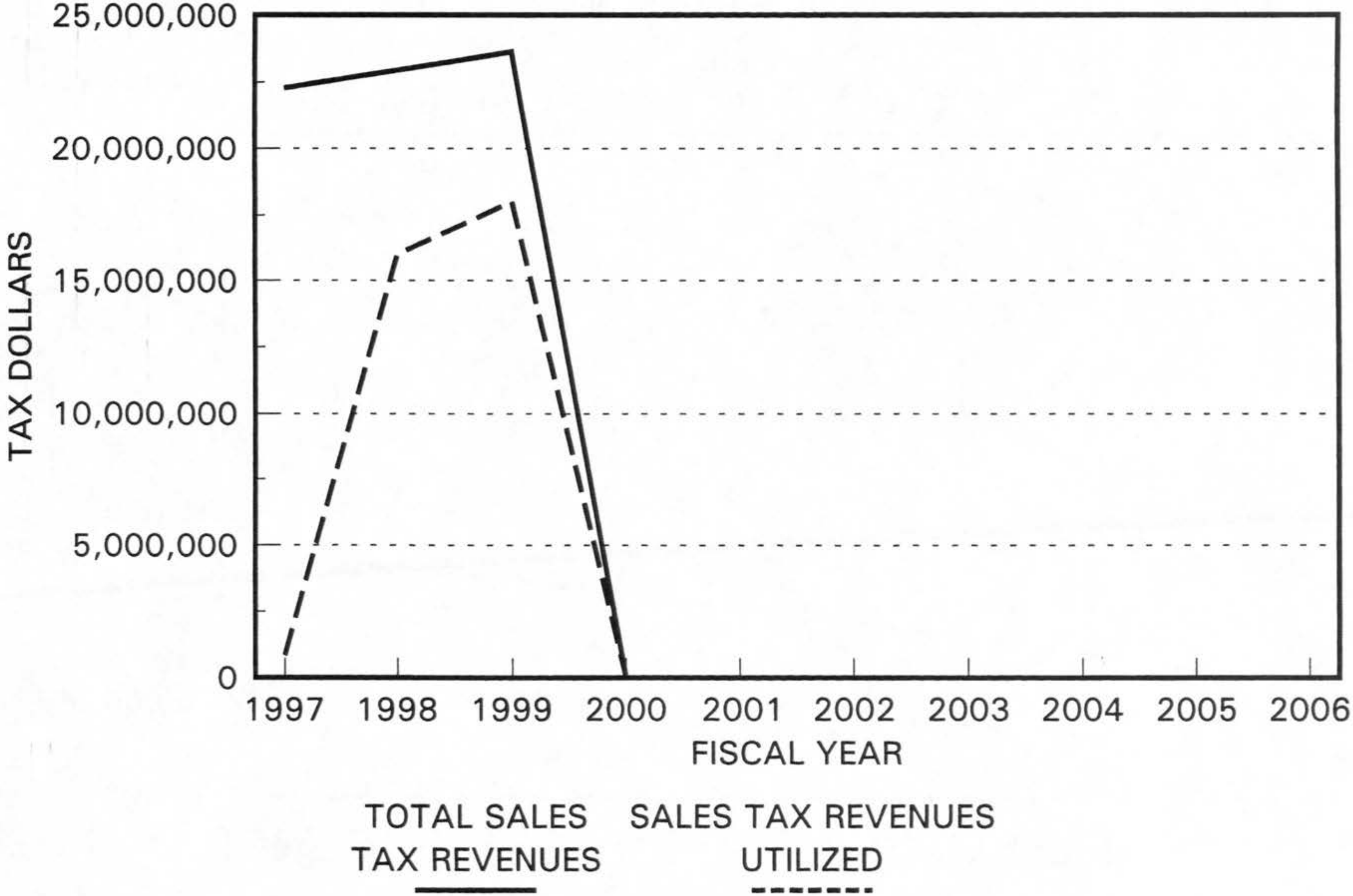
PORTION OF TAX UTILIZED

SALES TAX REVENUES VS. BONDED SALES TAX REVENUES



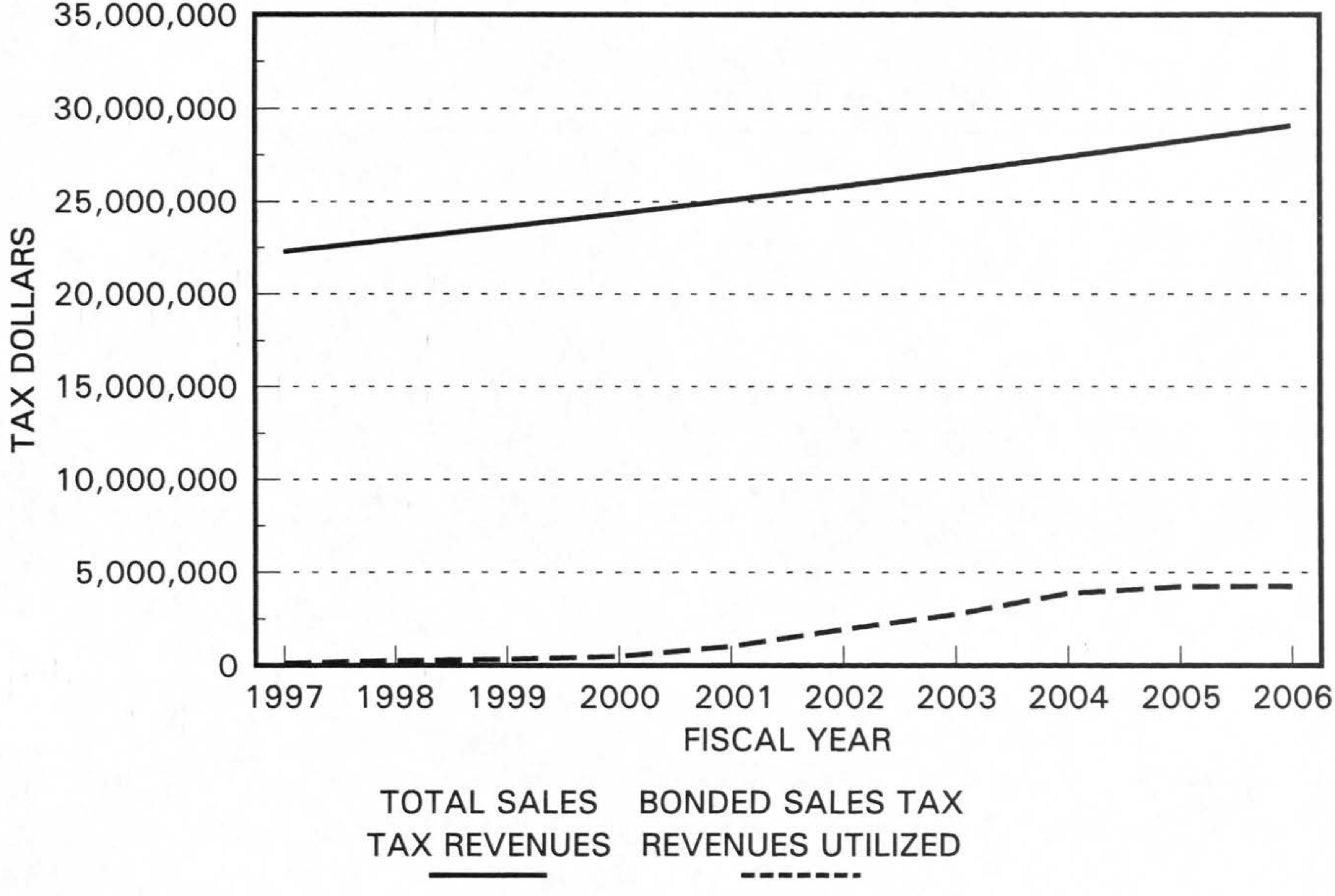
Graph 10

SALES TAX DOLLARS UTILIZED



Graph 11

BONDED SALES TAX DOLLARS UTILIZED



APPENDIX I

REAL ESTATE PLAN

REAL ESTATE PLAN

1. General. This Plan contains information that is tentative in nature for planning purposes only. The final real property acquisition lines and the estimate of value are subject to change even after approval of the Project Management Plan. All plates and exhibits referred to are within this Plan.

2. Project Authorization. The East Baton Rouge Tributaries project is authorized by a 14 April 1967 resolution of the Committee on Public Works of the United States Senate.

3. Reconnaissance Report. The Reconnaissance Report was approved 15 February 1985.

4. Local Sponsor. The local sponsor during this study is the Louisiana Department of Transportation and Development. However, after the study, the project local sponsor will be the Metropolitan Council of the City of Baton Rouge/East Baton Rouge Parish (East Baton Rouge Parish). When later in this plan statements are made that the local sponsor claims to own certain existing rights-of-way, that sponsor is East Baton Rouge Parish.

East Baton Rouge Parish has verbally expressed financial capability to fulfill all requirements of local co-operation for the project. They have provided documentation to show that they currently have the power of "quick-take". See Exhibit "D".

5. Location. The project area lies in East Baton Rouge Parish, LA. East Baton Rouge Parish is in southeast Louisiana. It is bounded on the west by the Mississippi River; on the east by the Amite River and Livingston Parish; on the south by Bayou Manchac and Iberville and Ascension Parishes; and on the north by East Feliciana Parish.

6. General Description of Project. The project involves increasing the capacity of five streams, and their tributaries, to improve watershed drainage, thereby reducing or eliminating flooding. The watershed names are: Beaver Bayou, Blackwater Bayou, Bayou Fountain, Jones Creek, and Wards Creek. Jones Creek (See plate 3) does not require new channel easement acquisition. The local sponsor claims to have sufficient interest across the streams in this watershed. Conversion of a small part of this existing channel easements to fee for recreational use is needed. Ward Creek (See plate 4) watershed will not require acquisition of new channel rights-of-way since the local sponsor claims to have sufficient interest across the streams. Because these existing rights-of-way for Jones Creek and Ward Creek watersheds have not been contributed to any other Federal construction project, the local sponsor's interest will be treated as new rights-of-way for crediting purposes. The local sponsor's interests to be acquired on the five watersheds are as follows:

Ward Creek Watershed....................	7.00 acres
Jones Creek Watershed....................	13.30 acres
Beaver Bayou Watershed..................	143.90 acres
Bayou Fountain Watershed................	179.11 acres
Blackwater Bayou Watershed..............	259.10 acres
TOTAL....................................	602.41 acres

Of the 602.41 acres to be acquired, 13.30 acres, to be acquired in fee, are to be used for constructing a bike path along the Jones Creek Watershed. Seven acres, and 14 acres, for remote, temporary (4 years) dredged material disposal easements must be acquired for Ward Creek, and Bayou Fountain watersheds, respectively. An area of 30.47 acres is needed for temporary construction on Bayou Fountain. The remaining 537.64 acres are needed to construct, maintain, repair, operate, patrol and replace drainage canals.

The following is a description and requirements breakdown for the three watersheds for which new channel rights-of-way are to be acquired:

a. Beaver Bayou Watershed. Beaver Bayou watershed is located in the northeast portion of East Baton Rouge Parish. The work at this watershed consists of widening about 15 miles of channel. The width of the right-of-way is 160 feet; except the last approximate 8,000 feet will have a width of 205 feet. Of the 143.90 acres required for this watershed, 10.50 are encumbered by an existing easement claimed by the East Baton Rouge Parish government. The only improvements on the land to be acquired is a bulkhead. The terrain varies from highland, not subject to flooding, to low, wet open tree land subject to flooding. There are approximately 100 ownerships in the right-of-way to be acquired. Some of the ownerships are in large parcels. See plate 1 for the location of this watershed.

b. Bayou Fountain Watershed. Bayou Fountain watershed is located in the southwest portion of East Baton Rouge Parish. The work at this watershed consists of clearing and snagging all but approximately 2.7 miles of the entire 11 mile length of the bayou. In the 2.7 mile section the channel bottom will be widened to fifty feet. The right-of-way widths will vary from 65 to 165 feet. Of the 179.11 acres required for this watershed, 134.64 acres are needed for the drainage canal, 3.59 acres over which the local sponsor owns an existing easement, and 9.10 acres of which they own in fee; while 30.47 acres are needed for temporary (2 year) construction. The remaining 14.00 acres are for the previously mentioned remote dredged material disposal easement. The terrain varies from highland not subject to flooding, to low wet treelands. There are approximately 275 ownerships in the right-of-way to be acquired. See plate 2 for the location of this watershed.

c. Blackwater Bayou Watershed. Blackwater Bayou watershed is also located in the northeast portion of East Baton Rouge Parish. The work at this watershed consists of widening about 17 miles of channel. The width of the right-of-way is 150 feet; except the last approximate 5,000

feet will have a width of 180 feet. Of the 259.10 acres required for this watershed, 37.20 are encumbered by an existing easement claimed by the East Baton Rouge Parish government. There are no improvements on the land to be acquired. The terrain varies from highland, not subject to flooding, to low, wet open tree land subject to flooding. There are approximately 100 ownerships in the right-of-way to be acquired. See plate 1 for the location of this watershed.

7. Mitigation. A total of 397 acres are to be acquired in fee for mitigation. There are two proposed sites. One of the sites is located in the northeast portion of East Baton Rouge Parish, between Hubbs Road and Joor Road. It straddles Beaver Bayou in its upper reaches. It contains 282 acres, and is owned by 2 landowners. There are no improvements on the site, and no relocations and removals are required. See Plate 1 for location. The other site is located in extreme southern East Baton Rouge Parish, near Highland Road Park, just south of where Siegen Lane and Burbank Road meet. It contains 115 acres, and is owned by 2 landowners. There are no improvements on the site, and no relocations and removals are required. See Plate 2 for location.

8. Federal Ownership. Initial research shows no land owned by the Government within the study area. Nor is any land encumbered with a Government easement.

9. Highest and Best Use of the Land. The highest and best use of the land is for woodland, openland, agricultural, residential, and potential residential (speculative); and for existing channel.

10. Uniform Relocation Assistance. No houses, farms, churches, or businesses will be affected by the project. No Uniform Relocation Assistance benefits costs will be expended.

11. Towns and Cemeteries. The portions of the project requiring the acquisition of new rights-of-way for drainage canals are within metropolitan Baton Rouge, outside of, but in close proximity to, the corporate limits of the city. No "town" relocations and removals are required. We are not aware of the existence of any cemetery within the planned project area. If cemeteries are discovered the project will be designed to avoid them.

12. Minerals. No mineral activity was observed within the required rights-of-way. Minerals have not been valued for this project; all realty interests will be acquired subject to existing mineral leases.

13. Timber. All merchantable timber values are included in the values for the land since the merchantable timber observed at the watersheds did not meet the quantity or quality acceptable for valuing separately.

14. Chart of Accounts. See Exhibit "A". In the Ward Creek Watershed portion of the Chart of Accounts, the 01R1B and 01RX lines each contain a $330 amount representing a one-third (1/3) allocation of the estimated amounts shown in the Mississippi River Batture (Disposal Area) portion of Exhibit "B". Likewise, in the Bayou Fountain Watershed portion of

the Chart of Accounts, the 01R1B and 01RX lines each contain a $670 amount representing the remaining two-thirds (2/3) allocation of the estimated amounts shown in the Mississippi River Batture (Disposal Area) portion of Exhibit "B". The one-third/two-third allocation is based on the proportion of the volume of disposal material generated at each watershed.

In the Mitigation portion of the Chart of Accounts, the 01R1B line contains an amount that is a combination of the estimated amounts for lands and damages in the Hubbs Road (Mitigation Site) and the Burbank Drive Near Siegen Lane (Mitigation Site) portions of Exhibit "B"; while the 01RX line is a combination of the estimated amounts of contingencies for those sites in Exhibit "B". The 01R1B and 01RX line amounts cannot be tracked directly in the Tentatively Selected Plan Chart of Accounts tables in the Main Report for each watershed, since the total mitigation is apportioned to each watershed based on the environmental damage incurred at each watershed.

15. Cost. Total estimated LERRDs costs amount to $3,869,000. See Exhibit "B" for project real estate costs broken down by watersheds, mitigation, and remote dredged material disposal site. There are several privately owned bridges or crossings on Beaver Bayou and Blackwater Bayou Watersheds. The $369,000 severance amount at Beaver Bayou, and the $324,000 severance amount at Blackwater Bayou are based on the comparison of loss in value to the remainder due to severed access versus bridge replacement costs.

16. Schedule of Acquisition. See Exhibit "C". Durations expressed are for the first contract only. First contract is Bayou Fountain watershed.

17. Estates. Four estates are required for the project: a. Fee - for mitigation, and recreation; b. Drainage Canal Easement; c. Temporary Construction Easement; and d. Temporary Dredged Material Disposal Easement. These are standard estates. See Exhibit "D" for the full text of each.

It will not be necessary to acquire a disposal easement for the clearing, snagging, and excavating operations at Beaver Bayou, Blackwater Bayou, and Jones Creek projects. The local sponsor will make a landfill it owns in the northwest part of the parish available without cost. Also, existing borrow pits located on the Mississippi River batture will be used for disposal for the Bayou Fountain and Ward Creek projects. East Baton Rouge Parish will acquire a 21-acre temporary disposal easement from the landowner.

18. Navigational Servitude. All the streams in the project are non-navigable. The Federal Navigational Servitude will not be used.

19. Access. Access to the watersheds can be gained via motor vehicle or by walking.

20. Status of EIS; Section 404 Evaluation; Endangered Species Investigation; and Hazardous, Toxic, and Radiological Wastes (HTRW) Report.

a. EIS. An Environmental Impact Statement has been prepared and is included in this Feasibility Report.

b. Section 404 Evaluation. 404(b) (1) Evaluations have been prepared for all necessary features of the tentatively selected plans. Application for State Water Quality Certifications has been made. The evaluations are contained within the Environmental Appendix to this Feasibility Report and the EIS.

c. Endangered Species Investigations. Based upon investigations at this stage of design, the proposed action is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat for such species. Appropriate documentation is included in the EIS and as a section of the environmental appendix to this Feasibility Report and EIS.

d. Cultural Resources Investigation. Preliminary cultural resources investigations were completed for the project during 1990. These investigations have been coordinated with the State Historic Preservation Office (SHPO). Plans to conduct additional investigations during the design phase of the project are being coordinated with the SHPO. All necessary cultural resources studies and coordination will be completed prior to construction.

e. HTRW Report. The HTRW Initial Investigation for the project included site characterization and geology, land use history, regulatory agency review and visual site survey. The investigation revealed several areas of potential HTRW contamination. During the next phase of the HTRW investigation, which includes sampling and testing, these areas will be further defined and the type and extent of contamination will be characterized. The draft HTRW report will be completed by 12 May 1993 and the final document will be completed by 19 May 1993. Refer to the HTRW Appendix in this Feasibility Report for the detailed HTRW Initial Investigation Report.

Initiation of real estate acquisition will not occur before the final HTRW document is completed.

21. Relocations and Removals. Within the project area there are 25 facilities or utilities affected by the project. Eleven (11) affected items are in the Beaver Bayou watershed. Thirteen (13) affected items are in the Blackwater Bayou watershed. The one remaining item of relocation and removal is in the Bayou Fountain watershed. The construction cost to relocate or remove all items is estimated at $4,153,000.

a. Beaver Bayou Watershed. At Beaver Bayou watershed, 5 of the 11 items to be relocated or removed are gas pipelines; 3 of the 11 are waterlines; 1 is a culverts; 1 is a public bridge; and one is a public road. The bridge and culvert are on public roads. The cost to relocate or remove these items is estimated at $1,985,000. See plate 5 for the location of these items.

b. Blackwater Bayou Watershed. At Blackwater Bayou watershed, 8 of the 13 items to be relocated, or removed, are public bridges. Seven bridges are to be relocated; an eighth bridge is to be removed. The remaining five items to be permanently relocated are petroleum pipelines. The cost to relocate or remove these items is estimated at $2,164,000. See Plate 5 for the location of these items.

c. Bayou Fountain Watershed. At Bayou Fountain watershed 176 linear feet of pipeline is to be relocated or removed. The cost to relocate or remove this item is estimated at $4,000.

Because all items to be relocated and removed are within new rights-of-way to be acquired, all facilities owners are compensable. An Attorney's Report of Compensability will be developed during the Plans and Specification (P&S) phase.

22. Attitude of the Landowners. The attitude of the landowners is not known. Public meetings are planned after public release of this document.

EXHIBIT "A"

CIVIL WORKS CHART OF ACCOUNTS
EAST BATON ROUGE TRIBUTARIES

22 September 1994

			(R)$5,658,000
01	LANDS AND DAMAGES		$5,657,950
01A	PROJECT PLANNING		0
01AX	CONTINGENCIES	0	
01B	ACQUISITIONS		734350
01B1	BY GOVT	51870	
01B2	BY LOCAL SPONSOR (LS)	499700	
01B3	BY GOVT ON BEHALF OF LS	0	
01B4	REVIEW OF LS	35910	
01BX	CONTINGENCIES	146870	
01C	CONDEMNATIONS		66280
01C1	BY GOVT	0	
01C2	BY LS	37170	
01C3	BY GOVT ON BEHALF OF LS	0	
01C4	REVIEW OF LS	15850	
01CX	CONTINGENCIES	13260	
01D	INLEASING		0
01D1	BY GOVT	0	
01D2	BY LS	0	
01D3	BY GOVT ON BEHALF OF LS	0	
01D4	REVIEW OF LS	0	
01DX	CONTINGENCIES	0	
01E	APPRAISALS		739360
01E1	BY GOVT (IN HOUSE)	0	
01E2	BY GOVT (CONTRACT)	0	
01E3	BY LS	496430	
01E4	BY GOVT ON BEHALF OF LS	0	
01E5	REVIEW OF LS	95060	
01EX	CONTINGENCIES	147870	
01F	PL 91-646 ASSISTANCE		940
01F1	BY GOVT	0	
01F2	BY LS	560	
01F3	BY GOVT ON BEHALF OF LS	0	
01F4	REVIEW OF LS	190	
01FX	CONTINGENCIES	190	
01G	TEMPORARY PERMITS		105680
01G1	BY GOVT	20860	
01G2	BY LS	58080	
01G3	BY GOVT ON BEHALF OF LS	0	
01G4	REVIEW OF LS	5600	
01G5	OTHER	0	
01G6	DAMAGE CLAIMS	0	
01GX	CONTINGENCIES	21140	

01H	AUDITS		0	
01H1	BY GOVT	0		
01H2	BY LS	0		
01H3	BY GOVT ON BEHALF OF LS	0		
01H4	REVIEW OF LS	0		
01HX	CONTINGENCIES	0		
01J	ENCROACHMENTS AND TRESPASS		0	
01J1	BY GOVT	0		
01J2	BY LS	0		
01J3	BY GOVT ON BEHALF OF LS	0		
01J4	REVIEW OF LS	0		
01JX	CONTINGENCIES	0		
01K	DISPOSALS		0	
01K1	BY GOVT	0		
01K2	BY LS	0		
01K3	BY GOVT ON BEHALF OF LS	0		
01K4	REVIEW OF LS	0		
01KX	CONTINGENCIES	0		
01L	REAL PROPERTY ACCOUNTABILITY		0	
01LX	CONTINGENCIES	0		
01R	REAL ESTATE PAYMENTS			3869000
01R1	LAND PAYMENTS		3092000	
01R1A	BY GOVT	0		
01R1B	BY LS	3092000		
01R1C	BY GOVT ON BEHALF OF LS	0		
01R1D	REVIEW OF LS	0		
01R2	PL 91-646 ASSISTANCE PAYMENTS		0	
01R2A	BY GOVT	0		
01R2B	BY LS	0		
01R2C	BY GOVT ON BEHALF OF LS	0		
01R2D	REVIEW OF LS	0		
01R3	DAMAGE PAYMENTS		0	
01R3A	BY GOVT	0		
01R3B	BY LS	0		
01R3C	BY GOVT ON BEHALF OF LS	0		
01R3D	REVIEW OF LS	0		
01R9	OTHER		0	
01RX	CONTINGENCIES		777000	
01S	REAL ESTATE RECEIPTS		0	
01S1	DISPOSAL RECEIPTS-REIMBURSEMENTS(CR)-LANDS	0		
01S2	DISPOSAL RECEIPTS-GENERAL FUND(CR)-LANDS	0		
01T	LERRD CREDITS		142340	
01T1	LAND PAYMENTS	50050		
01T2	ADMINISTRATIVE COSTS	41710		
01T3	PL 91-646 ASSISTANCE	3480		
01T4	ALL OTHER	18630		
01TX	CONTINGENCIES	28470		

				(R) $0
21	RECONNAISSANCE STUDIES			$0
21H	REAL ESTATE ACTIVITIES		0	
21V	FEASIBILITY COST SHARING AGREEMENT		0	
				(R) $48,000
22	FEASIBILITY STUDIES			$48,060
22H	REAL ESTATE PLAN		48060	
22S	REPORT PREPARATION		0	
22S1	REAL ESTATE ACTIVITIES	0		
22S9	ALL OTHER ACTIVITIES	0		
22U	REAL ESTATE DESIGN MEMORANDUM		0	
22V	REAL ESTATE PLANNING REPORT		0	
24	MISCELLANEOUS		0	
24A	REAL ESTATE ACTIVITIES	0		
24D	ALL OTHER	0		
25	COLLECTION AND STUDY OF BASIC DATA		0	
25A	REAL ESTATE ACTIVITIES	0		
25D	ALL OTHER	0		
26	RESEARCH AND DEVELOPMENT		0	
26A	REAL ESTATE ACTIVITIES	0		
26B	ALL OTHER	0		
27	REFORMULATION STUDIES		0	
27A	REAL ESTATE ACTIVITIES	0		
27D	ALL OTHER	0		
				(R) $6,000
29	PROJECT COOPERATION AGREEMENTS (PCA)			$5,580
29A	DRAFT PCA		1860	
29A1	REAL ESTATE ACTIVITIES	1860		
29A9	ALL OTHER ACTIVITIES	0		
29B	FINAL PCA AND FINANCIAL PLAN		1860	
29B1	REAL ESTATE ACTIVITIES	1860		
29B9	ALL OTHER ACTIVITIES	0		
29C	PCA NEGOTIATIONS		1860	
29C1	REAL ESTATE ACTIVITIES	1860		
29C9	ALL OTHER ACTIVITIES	0		
29D	TRANSFER OF PROJECT SPONSOR		0	

			(R) $0	
51	OPERATION & MAINTENANCE DURING CONSTRUCTION		$0	
51A	REAL ESTATE LEASING		0	
51A1	INLEASING	0		
51A2	RELOCATION ASSISTANCE	0		
51A3	DISPOSAL ASSISTANCE	0		
51A4	RELOCATION ASSISTANCE PAYMENTS (PL 91-646)	0		
51A5	RENTS, INITIAL ALTERATIONS AND RESTORATIONS	0		
51B	REAL ESTATE MANAGEMENT SERVICES			0
51B1	INSPECTIONS		0	
51B1A	COMPLIANCE	0		
51B1B	UTILIZATION	0		
51B2	OUTGRANTS		0	
51B2A	REGULAR	0		
51B2B	OIL AND GAS	0		
51B3	DISPOSALS		0	
51B4	ENCROACHMENTS AND TRESPASS		0	
51C	OTHER OPERATION & MAINTENANCE EXPENSES		0	
51D	REVENUES FROM OUTLEASES RETURNED TO U.S.		0	
51E	AUDITS		0	
51F	TIMBER HARVEST		0	
51G	REPAYMENTS AND COST DISTRIBUTIONS		0	
51H	MISCELLANEOUS RECEIPTS		0	
51H1	REAL ESTATE MANAGEMENT INCOME	0		
51H9	OTHER INCOME	0		
52	SURVEYS AND LAYOUTS		0	
53	REAL ESTATE ADMINISTRATIVE ACTIVITIES		0	

CIVIL WORKS CHART OF ACCOUNTS
EAST BATON ROUGE TRIBUTARIES
WARD CREEK WATERSHED

22 September 1994

				(R)$48,000
01	LANDS AND DAMAGES			$47,560
01A	PROJECT PLANNING		0	
01AX	CONTINGENCIES	0		
01B	ACQUISITIONS		11580	
01B1	BY GOVT	5060		
01B2	BY LOCAL SPONSOR (LS)	1940		
01B3	BY GOVT ON BEHALF OF LS	0		
01B4	REVIEW OF LS	2260		
01BX	CONTINGENCIES	2320		
01C	CONDEMNATIONS		0	
01C1	BY GOVT	0		
01C2	BY LS	0		
01C3	BY GOVT ON BEHALF OF LS	0		
01C4	REVIEW OF LS	0		
01CX	CONTINGENCIES	0		
01D	INLEASING		0	
01D1	BY GOVT	0		
01D2	BY LS	0		
01D3	BY GOVT ON BEHALF OF LS	0		
01D4	REVIEW OF LS	0		
01DX	CONTINGENCIES	0		
01E	APPRAISALS		0	
01E1	BY GOVT (IN HOUSE)	0		
01E2	BY GOVT (CONTRACT)	0		
01E3	BY LS	0		
01E4	BY GOVT ON BEHALF OF LS	0		
01E5	REVIEW OF LS	0		
01EX	CONTINGENCIES	0		
01F	PL 91-646 ASSISTANCE		0	
01F1	BY GOVT	0		
01F2	BY LS	0		
01F3	BY GOVT ON BEHALF OF LS	0		
01F4	REVIEW OF LS	0		
01FX	CONTINGENCIES	0		
01G	TEMPORARY PERMITS		7830	
01G1	BY GOVT	2310		
01G2	BY LS	3460		
01G3	BY GOVT ON BEHALF OF LS	0		
01G4	REVIEW OF LS	490		
01G5	OTHER	0		
01G6	DAMAGE CLAIMS	0		
01GX	CONTINGENCIES	1570		

01H	AUDITS		0	
01H1	BY GOVT	0		
01H2	BY LS	0		
01H3	BY GOVT ON BEHALF OF LS	0		
01H4	REVIEW OF LS	0		
01HX	CONTINGENCIES	0		
01J	ENCROACHMENTS AND TRESPASS		0	
01J1	BY GOVT	0		
01J2	BY LS	0		
01J3	BY GOVT ON BEHALF OF LS	0		
01J4	REVIEW OF LS	0		
01JX	CONTINGENCIES	0		
01K	DISPOSALS		0	
01K1	BY GOVT	0		
01K2	BY LS	0		
01K3	BY GOVT ON BEHALF OF LS	0		
01K4	REVIEW OF LS	0		
01KX	CONTINGENCIES	0		
01L	REAL PROPERTY ACCOUNTABILITY		0	
01LX	CONTINGENCIES	0		
01R	REAL ESTATE PAYMENTS			2660
01R1	LAND PAYMENTS		1330	
01R1A	BY GOVT	0		
01R1B	BY LS	1330		
01R1C	BY GOVT ON BEHALF OF LS	0		
01R1D	REVIEW OF LS	0		
01R2	PL 91-646 ASSISTANCE PAYMENTS		0	
01R2A	BY GOVT	0		
01R2B	BY LS	0		
01R2C	BY GOVT ON BEHALF OF LS	0		
01R2D	REVIEW OF LS	0		
01R3	DAMAGE PAYMENTS		0	
01R3A	BY GOVT	0		
01R3B	BY LS	0		
01R3C	BY GOVT ON BEHALF OF LS	0		
01R3D	REVIEW OF LS	0		
01R9	OTHER		0	
01RX	CONTINGENCIES		1330	
01S	REAL ESTATE RECEIPTS		0	
01S1	DISPOSAL RECEIPTS-REIMBURSEMENTS(CR)-LANDS	0		
01S2	DISPOSAL RECEIPTS-GENERAL FUND(CR)-LANDS	0		
01T	LERRD CREDITS		25490	
01T1	LAND PAYMENTS	11120		
01T2	ADMINISTRATIVE COSTS	5870		
01T3	PL 91-646 ASSISTANCE	0		
01T4	ALL OTHER	3400		
01TX	CONTINGENCIES	5100		

21	RECONNAISSANCE STUDIES		(R) $0 $0
21H	REAL ESTATE ACTIVITIES		0
21V	FEASIBILITY COST SHARING AGREEMENT		0
22	FEASIBILITY STUDIES		(R) $1,000 $1,000
22H	REAL ESTATE PLAN		1000
22S	REPORT PREPARATION		0
22S1	REAL ESTATE ACTIVITIES	0	
22S9	ALL OTHER ACTIVITIES	0	
22U	REAL ESTATE DESIGN MEMORANDUM		0
22V	REAL ESTATE PLANNING REPORT		0
24	MISCELLANEOUS		0
24A	REAL ESTATE ACTIVITIES	0	
24D	ALL OTHER	0	
25	COLLECTION AND STUDY OF BASIC DATA		0
25A	REAL ESTATE ACTIVITIES	0	
25D	ALL OTHER	0	
26	RESEARCH AND DEVELOPMENT		0
26A	REAL ESTATE ACTIVITIES	0	
26B	ALL OTHER	0	
27	REFORMULATION STUDIES		0
27A	REAL ESTATE ACTIVITIES	0	
27D	ALL OTHER	0	
29	PROJECT COOPERATION AGREEMENTS (PCA)		(R) $0 $0
29A	DRAFT PCA		0
29A1	REAL ESTATE ACTIVITIES	0	
29A9	ALL OTHER ACTIVITIES	0	
29B	FINAL PCA AND FINANCIAL PLAN		0
29B1	REAL ESTATE ACTIVITIES	0	
29B9	ALL OTHER ACTIVITIES	0	
29C	PCA NEGOTIATIONS		0
29C1	REAL ESTATE ACTIVITIES	0	
29C9	ALL OTHER ACTIVITIES	0	
29D	TRANSFER OF PROJECT SPONSOR		0

			(R) $0	
51	OPERATION & MAINTENANCE DURING CONSTRUCTION		$0	
51A	REAL ESTATE LEASING		0	
51A1	INLEASING	0		
51A2	RELOCATION ASSISTANCE	0		
51A3	DISPOSAL ASSISTANCE	0		
51A4	RELOCATION ASSISTANCE PAYMENTS (PL 91-646)	0		
51A5	RENTS, INITIAL ALTERATIONS AND RESTORATIONS	0		
51B	REAL ESTATE MANAGEMENT SERVICES			0
51B1	INSPECTIONS		0	
51B1A	COMPLIANCE	0		
51B1B	UTILIZATION	0		
51B2	OUTGRANTS		0	
51B2A	REGULAR	0		
51B2B	OIL AND GAS	0		
51B3	DISPOSALS		0	
51B4	ENCROACHMENTS AND TRESPASS		0	
51C	OTHER OPERATION & MAINTENANCE EXPENSES		0	
51D	REVENUES FROM OUTLEASES RETURNED TO U.S.		0	
51E	AUDITS		0	
51F	TIMBER HARVEST		0	
51G	REPAYMENTS AND COST DISTRIBUTIONS		0	
51H	MISCELLANEOUS RECEIPTS		0	
51H1	REAL ESTATE MANAGEMENT INCOME	0		
51H9	OTHER INCOME	0		
52	SURVEYS AND LAYOUTS		0	
53	REAL ESTATE ADMINISTRATIVE ACTIVITIES		0	

CIVIL WORKS CHART OF ACCOUNTS
EAST BATON ROUGE TRIBUTARIES
JONES CREEK WATERSHED

22 September 1994

				(R) $126,000
01	LANDS AND DAMAGES			$125,560
01A	PROJECT PLANNING		0	
01AX	CONTINGENCIES	0		
01B	ACQUISITIONS		54410	
01B1	BY GOVT	18460		
01B2	BY LOCAL SPONSOR (LS)	19800		
01B3	BY GOVT ON BEHALF OF LS	0		
01B4	REVIEW OF LS	5270		
01BX	CONTINGENCIES	10880		
01C	CONDEMNATIONS		0	
01C1	BY GOVT	0		
01C2	BY LS	0		
01C3	BY GOVT ON BEHALF OF LS	0		
01C4	REVIEW OF LS	0		
01CX	CONTINGENCIES	0		
01D	INLEASING		0	
01D1	BY GOVT	0		
01D2	BY LS	0		
01D3	BY GOVT ON BEHALF OF LS	0		
01D4	REVIEW OF LS	0		
01DX	CONTINGENCIES	0		
01E	APPRAISALS		2250	
01E1	BY GOVT (IN HOUSE)	0		
01E2	BY GOVT (CONTRACT)	0		
01E3	BY LS	1000		
01E4	BY GOVT ON BEHALF OF LS	0		
01E5	REVIEW OF LS	800		
01EX	CONTINGENCIES	450		
01F	PL 91-646 ASSISTANCE		0	
01F1	BY GOVT	0		
01F2	BY LS	0		
01F3	BY GOVT ON BEHALF OF LS	0		
01F4	REVIEW OF LS	0		
01FX	CONTINGENCIES	0		
01G	TEMPORARY PERMITS		32140	
01G1	BY GOVT	9230		
01G2	BY LS	13840		
01G3	BY GOVT ON BEHALF OF LS	0		
01G4	REVIEW OF LS	2640		
01G5	OTHER	0		
01G6	DAMAGE CLAIMS	0		
01GX	CONTINGENCIES	6430		

01H	AUDITS		0	
01H1	BY GOVT	0		
01H2	BY LS	0		
01H3	BY GOVT ON BEHALF OF LS	0		
01H4	REVIEW OF LS	0		
01HX	CONTINGENCIES	0		
01J	ENCROACHMENTS AND TRESPASS		0	
01J1	BY GOVT	0		
01J2	BY LS	0		
01J3	BY GOVT ON BEHALF OF LS	0		
01J4	REVIEW OF LS	0		
01JX	CONTINGENCIES	0		
01K	DISPOSALS		0	
01K1	BY GOVT	0		
01K2	BY LS	0		
01K3	BY GOVT ON BEHALF OF LS	0		
01K4	REVIEW OF LS	0		
01KX	CONTINGENCIES	0		
01L	REAL PROPERTY ACCOUNTABILITY		0	
01LX	CONTINGENCIES	0		
01R	REAL ESTATE PAYMENTS			2000
01R1	LAND PAYMENTS		1000	
01R1A	BY GOVT	0		
01R1B	BY LS	1000		
01R1C	BY GOVT ON BEHALF OF LS	0		
01R1D	REVIEW OF LS	0		
01R2	PL 91-646 ASSISTANCE PAYMENTS		0	
01R2A	BY GOVT	0		
01R2B	BY LS	0		
01R2C	BY GOVT ON BEHALF OF LS	0		
01R2D	REVIEW OF LS	0		
01R3	DAMAGE PAYMENTS		0	
01R3A	BY GOVT	0		
01R3B	BY LS	0		
01R3C	BY GOVT ON BEHALF OF LS	0		
01R3D	REVIEW OF LS	0		
01R9	OTHER		0	
01RX	CONTINGENCIES		1000	
01S	REAL ESTATE RECEIPTS		0	
01S1	DISPOSAL RECEIPTS-REIMBURSEMENTS(CR)-LANDS	0		
01S2	DISPOSAL RECEIPTS-GENERAL FUND(CR)-LANDS	0		
01T	LERRD CREDITS		34760	
01T1	LAND PAYMENTS	11120		
01T2	ADMINISTRATIVE COSTS	13290		
01T3	PL 91-646 ASSISTANCE	0		
01T4	ALL OTHER	3400		
01TX	CONTINGENCIES	6950		

			(R) $0
21	RECONNAISSANCE STUDIES		$0
21H	REAL ESTATE ACTIVITIES		0
21V	FEASIBILITY COST SHARING AGREEMENT		0
			(R) $1,000
22	FEASIBILITY STUDIES		$1,000
22H	REAL ESTATE PLAN		1000
22S	REPORT PREPARATION		0
22S1	REAL ESTATE ACTIVITIES	0	
22S9	ALL OTHER ACTIVITIES	0	
22U	REAL ESTATE DESIGN MEMORANDUM		0
22V	REAL ESTATE PLANNING REPORT		0
24	MISCELLANEOUS		0
24A	REAL ESTATE ACTIVITIES	0	
24D	ALL OTHER	0	
25	COLLECTION AND STUDY OF BASIC DATA		0
25A	REAL ESTATE ACTIVITIES	0	
25D	ALL OTHER	0	
26	RESEARCH AND DEVELOPMENT		0
26A	REAL ESTATE ACTIVITIES	0	
26B	ALL OTHER	0	
27	REFORMULATION STUDIES		0
27A	REAL ESTATE ACTIVITIES	0	
27D	ALL OTHER	0	
			(R) $0
29	PROJECT COOPERATION AGREEMENTS (PCA)		$0
29A	DRAFT PCA		0
29A1	REAL ESTATE ACTIVITIES	0	
29A9	ALL OTHER ACTIVITIES	0	
29B	FINAL PCA AND FINANCIAL PLAN		0
29B1	REAL ESTATE ACTIVITIES	0	
29B9	ALL OTHER ACTIVITIES	0	
29C	PCA NEGOTIATIONS		0
29C1	REAL ESTATE ACTIVITIES	0	
29C9	ALL OTHER ACTIVITIES	0	
29D	TRANSFER OF PROJECT SPONSOR		0

				(R) $0	
51	OPERATION & MAINTENANCE DURING CONSTRUCTION			$0	
51A	REAL ESTATE LEASING		0		
51A1	INLEASING	0			
51A2	RELOCATION ASSISTANCE	0			
51A3	DISPOSAL ASSISTANCE	0			
51A4	RELOCATION ASSISTANCE PAYMENTS (PL 91-646)	0			
51A5	RENTS, INITIAL ALTERATIONS AND RESTORATIONS	0			
51B	REAL ESTATE MANAGEMENT SERVICES				0
51B1	INSPECTIONS		0		
51B1A	COMPLIANCE	0			
51B1B	UTILIZATION	0			
51B2	OUTGRANTS		0		
51B2A	REGULAR	0			
51B2B	OIL AND GAS	0			
51B3	DISPOSALS		0		
51B4	ENCROACHMENTS AND TRESPASS		0		
51C	OTHER OPERATION & MAINTENANCE EXPENSES		0		
51D	REVENUES FROM OUTLEASES RETURNED TO U.S.		0		
51E	AUDITS		0		
51F	TIMBER HARVEST		0		
51G	REPAYMENTS AND COST DISTRIBUTIONS		0		
51H	MISCELLANEOUS RECEIPTS		0		
51H1	REAL ESTATE MANAGEMENT INCOME	0			
51H9	OTHER INCOME	0			
52	SURVEYS AND LAYOUTS		0		
53	REAL ESTATE ADMINISTRATIVE ACTIVITIES		0		

CIVIL WORKS CHART OF ACCOUNTS
EAST BATON ROUGE TRIBUTARIES
BEAVER BAYOU WATERSHED

22 September 1994

				(R) $1,478,000
01	LANDS AND DAMAGES			$1,478,130
01A	PROJECT PLANNING		0	
01AX	CONTINGENCIES	0		
01B	ACQUISITIONS		146980	
01B1	BY GOVT	7580		
01B2	BY LOCAL SPONSOR (LS)	103820		
01B3	BY GOVT ON BEHALF OF LS	0		
01B4	REVIEW OF LS	6180		
01BX	CONTINGENCIES	29400		
01C	CONDEMNATIONS		19790	
01C1	BY GOVT	0		
01C2	BY LS	12220		
01C3	BY GOVT ON BEHALF OF LS	0		
01C4	REVIEW OF LS	3610		
01CX	CONTINGENCIES	3960		
01D	INLEASING		0	
01D1	BY GOVT	0		
01D2	BY LS	0		
01D3	BY GOVT ON BEHALF OF LS	0		
01D4	REVIEW OF LS	0		
01DX	CONTINGENCIES	0		
01E	APPRAISALS		154500	
01E1	BY GOVT (IN HOUSE)	0		
01E2	BY GOVT (CONTRACT)	0		
01E3	BY LS	103000		
01E4	BY GOVT ON BEHALF OF LS	0		
01E5	REVIEW OF LS	20600		
01EX	CONTINGENCIES	30900		
01F	PL 91-646 ASSISTANCE		0	
01F1	BY GOVT	0		
01F2	BY LS	0		
01F3	BY GOVT ON BEHALF OF LS	0		
01F4	REVIEW OF LS	0		
01FX	CONTINGENCIES	0		
01G	TEMPORARY PERMITS		14160	
01G1	BY GOVT	2310		
01G2	BY LS	8360		
01G3	BY GOVT ON BEHALF OF LS	0		
01G4	REVIEW OF LS	660		
01G5	OTHER	0		
01G6	DAMAGE CLAIMS	0		
01GX	CONTINGENCIES	2830		

01H	AUDITS		0	
01H1	BY GOVT	0		
01H2	BY LS	0		
01H3	BY GOVT ON BEHALF OF LS	0		
01H4	REVIEW OF LS	0		
01HX	CONTINGENCIES	0		
01J	ENCROACHMENTS AND TRESPASS		0	
01J1	BY GOVT	0		
01J2	BY LS	0		
01J3	BY GOVT ON BEHALF OF LS	0		
01J4	REVIEW OF LS	0		
01JX	CONTINGENCIES	0		
01K	DISPOSALS		0	
01K1	BY GOVT	0		
01K2	BY LS	0		
01K3	BY GOVT ON BEHALF OF LS	0		
01K4	REVIEW OF LS	0		
01KX	CONTINGENCIES	0		
01L	REAL PROPERTY ACCOUNTABILITY		0	
01LX	CONTINGENCIES	0		
01R	REAL ESTATE PAYMENTS			1123000
01R1	LAND PAYMENTS		898000	
01R1A	BY GOVT	0		
01R1B	BY LS	898000		
01R1C	BY GOVT ON BEHALF OF LS	0		
01R1D	REVIEW OF LS	0		
01R2	PL 91-646 ASSISTANCE PAYMENTS		0	
01R2A	BY GOVT	0		
01R2B	BY LS	0		
01R2C	BY GOVT ON BEHALF OF LS	0		
01R2D	REVIEW OF LS	0		
01R3	DAMAGE PAYMENTS		0	
01R3A	BY GOVT	0		
01R3B	BY LS	0		
01R3C	BY GOVT ON BEHALF OF LS	0		
01R3D	REVIEW OF LS	0		
01R9	OTHER		0	
01RX	CONTINGENCIES		225000	
01S	REAL ESTATE RECEIPTS		0	
01S1	DISPOSAL RECEIPTS-REIMBURSEMENTS(CR)-LANDS	0		
01S2	DISPOSAL RECEIPTS-GENERAL FUND(CR)-LANDS	0		
01T	LERRD CREDITS		19700	
01T1	LAND PAYMENTS	6490		
01T2	ADMINISTRATIVE COSTS	5870		
01T3	PL 91-646 ASSISTANCE	0		
01T4	ALL OTHER	3400		
01TX	CONTINGENCIES	3940		

21	RECONNAISSANCE STUDIES			(R) $0 $0
21H	REAL ESTATE ACTIVITIES		0	
21V	FEASIBILITY COST SHARING AGREEMENT		0	
22	FEASIBILITY STUDIES			(R) $12,000 $12,480
22H	REAL ESTATE PLAN		12480	
22S	REPORT PREPARATION		0	
22S1	REAL ESTATE ACTIVITIES	0		
22S9	ALL OTHER ACTIVITIES	0		
22U	REAL ESTATE DESIGN MEMORANDUM		0	
22V	REAL ESTATE PLANNING REPORT		0	
24	MISCELLANEOUS		0	
24A	REAL ESTATE ACTIVITIES	0		
24D	ALL OTHER	0		
25	COLLECTION AND STUDY OF BASIC DATA		0	
25A	REAL ESTATE ACTIVITIES	0		
25D	ALL OTHER	0		
26	RESEARCH AND DEVELOPMENT		0	
26A	REAL ESTATE ACTIVITIES	0		
26B	ALL OTHER	0		
27	REFORMULATION STUDIES		0	
27A	REAL ESTATE ACTIVITIES	0		
27D	ALL OTHER	0		
29	PROJECT COOPERATION AGREEMENTS (PCA)			(R) $2,000 $1,860
29A	DRAFT PCA		620	
29A1	REAL ESTATE ACTIVITIES	620		
29A9	ALL OTHER ACTIVITIES	0		
29B	FINAL PCA AND FINANCIAL PLAN		620	
29B1	REAL ESTATE ACTIVITIES	620		
29B9	ALL OTHER ACTIVITIES	0		
29C	PCA NEGOTIATIONS		620	
29C1	REAL ESTATE ACTIVITIES	620		
29C9	ALL OTHER ACTIVITIES	0		
29D	TRANSFER OF PROJECT SPONSOR		0	

			(R)$0	
51	OPERATION & MAINTENANCE DURING CONSTRUCTION		$0	
51A	REAL ESTATE LEASING		0	
51A1	INLEASING	0		
51A2	RELOCATION ASSISTANCE	0		
51A3	DISPOSAL ASSISTANCE	0		
51A4	RELOCATION ASSISTANCE PAYMENTS (PL 91-646)	0		
51A5	RENTS, INITIAL ALTERATIONS AND RESTORATIONS	0		
51B	REAL ESTATE MANAGEMENT SERVICES			0
51B1	INSPECTIONS		0	
51B1A	COMPLIANCE	0		
51B1B	UTILIZATION	0		
51B2	OUTGRANTS		0	
51B2A	REGULAR	0		
51B2B	OIL AND GAS	0		
51B3	DISPOSALS		0	
51B4	ENCROACHMENTS AND TRESPASS		0	
51C	OTHER OPERATION & MAINTENANCE EXPENSES		0	
51D	REVENUES FROM OUTLEASES RETURNED TO U.S.		0	
51E	AUDITS		0	
51F	TIMBER HARVEST		0	
51G	REPAYMENTS AND COST DISTRIBUTIONS		0	
51H	MISCELLANEOUS RECEIPTS		0	
51H1	REAL ESTATE MANAGEMENT INCOME	0		
51H9	OTHER INCOME	0		
52	SURVEYS AND LAYOUTS		0	
53	REAL ESTATE ADMINISTRATIVE ACTIVITIES		0	

CIVIL WORKS CHART OF ACCOUNTS
EAST BATON ROUGE TRIBUTARIES
BAYOU FOUNTAIN WATERSHED

22 September 1994

			(R) $1,195,000
01	LANDS AND DAMAGES		$1,194,570
01A	PROJECT PLANNING		0
01AX	CONTINGENCIES	0	
01B	ACQUISITIONS		360290
01B1	BY GOVT	9230	
01B2	BY LOCAL SPONSOR (LS)	264090	
01B3	BY GOVT ON BEHALF OF LS	0	
01B4	REVIEW OF LS	14910	
01BX	CONTINGENCIES	72060	
01C	CONDEMNATIONS		23460
01C1	BY GOVT	0	
01C2	BY LS	10570	
01C3	BY GOVT ON BEHALF OF LS	0	
01C4	REVIEW OF LS	8200	
01CX	CONTINGENCIES	4690	
01D	INLEASING		0
01D1	BY GOVT	0	
01D2	BY LS	0	
01D3	BY GOVT ON BEHALF OF LS	0	
01D4	REVIEW OF LS	0	
01DX	CONTINGENCIES	0	
01E	APPRAISALS		418440
01E1	BY GOVT (IN HOUSE)	0	
01E2	BY GOVT (CONTRACT)	0	
01E3	BY LS	283250	
01E4	BY GOVT ON BEHALF OF LS	0	
01E5	REVIEW OF LS	51500	
01EX	CONTINGENCIES	83690	
01F	PL 91-646 ASSISTANCE		0
01F1	BY GOVT	0	
01F2	BY LS	0	
01F3	BY GOVT ON BEHALF OF LS	0	
01F4	REVIEW OF LS	0	
01FX	CONTINGENCIES	0	
01G	TEMPORARY PERMITS		31530
01G1	BY GOVT	2970	
01G2	BY LS	21590	
01G3	BY GOVT ON BEHALF OF LS	0	
01G4	REVIEW OF LS	660	
01G5	OTHER	0	
01G6	DAMAGE CLAIMS	0	
01GX	CONTINGENCIES	6310	

01H	AUDITS		0	
01H1	BY GOVT	0		
01H2	BY LS	0		
01H3	BY GOVT ON BEHALF OF LS	0		
01H4	REVIEW OF LS	0		
01HX	CONTINGENCIES	0		
01J	ENCROACHMENTS AND TRESPASS		0	
01J1	BY GOVT	0		
01J2	BY LS	0		
01J3	BY GOVT ON BEHALF OF LS	0		
01J4	REVIEW OF LS	0		
01JX	CONTINGENCIES	0		
01K	DISPOSALS		0	
01K1	BY GOVT	0		
01K2	BY LS	0		
01K3	BY GOVT ON BEHALF OF LS	0		
01K4	REVIEW OF LS	0		
01KX	CONTINGENCIES	0		
01L	REAL PROPERTY ACCOUNTABILITY		0	
01LX	CONTINGENCIES	0		
01R	REAL ESTATE PAYMENTS			330340
01R1	LAND PAYMENTS		263670	
01R1A	BY GOVT	0		
01R1B	BY LS	263670		
01R1C	BY GOVT ON BEHALF OF LS	0		
01R1D	REVIEW OF LS	0		
01R2	PL 91-646 ASSISTANCE PAYMENTS		0	
01R2A	BY GOVT	0		
01R2B	BY LS	0		
01R2C	BY GOVT ON BEHALF OF LS	0		
01R2D	REVIEW OF LS	0		
01R3	DAMAGE PAYMENTS		0	
01R3A	BY GOVT	0		
01R3B	BY LS	0		
01R3C	BY GOVT ON BEHALF OF LS	0		
01R3D	REVIEW OF LS	0		
01R9	OTHER		0	
01RX	CONTINGENCIES		66670	
01S	REAL ESTATE RECEIPTS		0	
01S1	DISPOSAL RECEIPTS-REIMBURSEMENTS(CR)-LANDS	0		
01S2	DISPOSAL RECEIPTS-GENERAL FUND(CR)-LANDS	0		
01T	LERRD CREDITS		30510	
01T1	LAND PAYMENTS	12050		
01T2	ADMINISTRATIVE COSTS	8030		
01T3	PL 91-646 ASSISTANCE	0		
01T4	ALL OTHER	4330		
01TX	CONTINGENCIES	6100		

				(R) $0
21	RECONNAISSANCE STUDIES			$0
21H	REAL ESTATE ACTIVITIES		0	
21V	FEASIBILITY COST SHARING AGREEMENT		0	
				(R) $9,000
22	FEASIBILITY STUDIES			$8,620
22H	REAL ESTATE PLAN		8620	
22S	REPORT PREPARATION		0	
22S1	REAL ESTATE ACTIVITIES	0		
22S9	ALL OTHER ACTIVITIES	0		
22U	REAL ESTATE DESIGN MEMORANDUM		0	
22V	REAL ESTATE PLANNING REPORT		0	
24	MISCELLANEOUS		0	
24A	REAL ESTATE ACTIVITIES	0		
24D	ALL OTHER	0		
25	COLLECTION AND STUDY OF BASIC DATA		0	
25A	REAL ESTATE ACTIVITIES	0		
25D	ALL OTHER	0		
26	RESEARCH AND DEVELOPMENT		0	
26A	REAL ESTATE ACTIVITIES	0		
26B	ALL OTHER	0		
27	REFORMULATION STUDIES		0	
27A	REAL ESTATE ACTIVITIES	0		
27D	ALL OTHER	0		
				(R) $2,000
29	PROJECT COOPERATION AGREEMENTS (PCA)			$1,860
29A	DRAFT PCA		620	
29A1	REAL ESTATE ACTIVITIES	620		
29A9	ALL OTHER ACTIVITIES	0		
29B	FINAL PCA AND FINANCIAL PLAN		620	
29B1	REAL ESTATE ACTIVITIES	620		
29B9	ALL OTHER ACTIVITIES	0		
29C	PCA NEGOTIATIONS		620	
29C1	REAL ESTATE ACTIVITIES	620		
29C9	ALL OTHER ACTIVITIES	0		
29D	TRANSFER OF PROJECT SPONSOR		0	

				(R) $0	
51	OPERATION & MAINTENANCE DURING CONSTRUCTION			$0	
51A	REAL ESTATE LEASING		0		
51A1	INLEASING	0			
51A2	RELOCATION ASSISTANCE	0			
51A3	DISPOSAL ASSISTANCE	0			
51A4	RELOCATION ASSISTANCE PAYMENTS (PL 91-646)	0			
51A5	RENTS, INITIAL ALTERATIONS AND RESTORATIONS	0			
51B	REAL ESTATE MANAGEMENT SERVICES				0
51B1	INSPECTIONS		0		
51B1A	COMPLIANCE	0			
51B1B	UTILIZATION	0			
51B2	OUTGRANTS		0		
51B2A	REGULAR	0			
51B2B	OIL AND GAS	0			
51B3	DISPOSALS		0		
51B4	ENCROACHMENTS AND TRESPASS		0		
51C	OTHER OPERATION & MAINTENANCE EXPENSES		0		
51D	REVENUES FROM OUTLEASES RETURNED TO U.S.		0		
51E	AUDITS		0		
51F	TIMBER HARVEST		0		
51G	REPAYMENTS AND COST DISTRIBUTIONS		0		
51H	MISCELLANEOUS RECEIPTS		0		
51H1	REAL ESTATE MANAGEMENT INCOME	0			
51H9	OTHER INCOME	0			
52	SURVEYS AND LAYOUTS		0		
53	REAL ESTATE ADMINISTRATIVE ACTIVITIES		0		

CIVIL WORKS CHART OF ACCOUNTS
EAST BATON ROUGE TRIBUTARIES
BLACKWATER BAYOU WATERSHED

20 September 1994

				(R)$1,479,000
01	LANDS AND DAMAGES			$1,479,040
01A	PROJECT PLANNING		0	
01AX	CONTINGENCIES	0		
01B	ACQUISITIONS		146900	
01B1	BY GOVT	7580		
01B2	BY LOCAL SPONSOR (LS)	103820		
01B3	BY GOVT ON BEHALF OF LS	0		
01B4	REVIEW OF LS	6120		
01BX	CONTINGENCIES	29380		
01C	CONDEMNATIONS		20780	
01C1	BY GOVT	0		
01C2	BY LS	13140		
01C3	BY GOVT ON BEHALF OF LS	0		
01C4	REVIEW OF LS	3480		
01CX	CONTINGENCIES	4160		
01D	INLEASING		0	
01D1	BY GOVT	0		
01D2	BY LS	0		
01D3	BY GOVT ON BEHALF OF LS	0		
01D4	REVIEW OF LS	0		
01DX	CONTINGENCIES	0		
01E	APPRAISALS		154500	
01E1	BY GOVT (IN HOUSE)	0		
01E2	BY GOVT (CONTRACT)	0		
01E3	BY LS	103000		
01E4	BY GOVT ON BEHALF OF LS	0		
01E5	REVIEW OF LS	20600		
01EX	CONTINGENCIES	30900		
01F	PL 91-646 ASSISTANCE		0	
01F1	BY GOVT	0		
01F2	BY LS	0		
01F3	BY GOVT ON BEHALF OF LS	0		
01F4	REVIEW OF LS	0		
01FX	CONTINGENCIES	0		
01G	TEMPORARY PERMITS		14160	
01G1	BY GOVT	2310		
01G2	BY LS	8360		
01G3	BY GOVT ON BEHALF OF LS	0		
01G4	REVIEW OF LS	660		
01G5	OTHER	0		
01G6	DAMAGE CLAIMS	0		
01GX	CONTINGENCIES	2830		

01H	AUDITS		0	
01H1	BY GOVT	0		
01H2	BY LS	0		
01H3	BY GOVT ON BEHALF OF LS	0		
01H4	REVIEW OF LS	0		
01HX	CONTINGENCIES	0		
01J	ENCROACHMENTS AND TRESPASS		0	
01J1	BY GOVT	0		
01J2	BY LS	0		
01J3	BY GOVT ON BEHALF OF LS	0		
01J4	REVIEW OF LS	0		
01JX	CONTINGENCIES	0		
01K	DISPOSALS		0	
01K1	BY GOVT	0		
01K2	BY LS	0		
01K3	BY GOVT ON BEHALF OF LS	0		
01K4	REVIEW OF LS	0		
01KX	CONTINGENCIES	0		
01L	REAL PROPERTY ACCOUNTABILITY		0	
01LX	CONTINGENCIES	0		
01R	REAL ESTATE PAYMENTS			1123000
01R1	LAND PAYMENTS		898000	
01R1A	BY GOVT	0		
01R1B	BY LS	898000		
01R1C	BY GOVT ON BEHALF OF LS	0		
01R1D	REVIEW OF LS	0		
01R2	PL 91-646 ASSISTANCE PAYMENTS		0	
01R2A	BY GOVT	0		
01R2B	BY LS	0		
01R2C	BY GOVT ON BEHALF OF LS	0		
01R2D	REVIEW OF LS	0		
01R3	DAMAGE PAYMENTS		0	
01R3A	BY GOVT	0		
01R3B	BY LS	0		
01R3C	BY GOVT ON BEHALF OF LS	0		
01R3D	REVIEW OF LS	0		
01R9	OTHER		0	
01RX	CONTINGENCIES		225000	
01S	REAL ESTATE RECEIPTS		0	
01S1	DISPOSAL RECEIPTS-REIMBURSEMENTS(CR)-LANDS	0		
01S2	DISPOSAL RECEIPTS-GENERAL FUND(CR)-LANDS	0		
01T	LERRD CREDITS		19700	
01T1	LAND PAYMENTS	6490		
01T2	ADMINISTRATIVE COSTS	5870		
01T3	PL 91-646 ASSISTANCE	0		
01T4	ALL OTHER	3400		
01TX	CONTINGENCIES	3940		

			(R) $0
21	RECONNAISSANCE STUDIES		$0
21H	REAL ESTATE ACTIVITIES		0
21V	FEASIBILITY COST SHARING AGREEMENT		0
			(R) $12,000
22	FEASIBILITY STUDIES		$12,480
22H	REAL ESTATE PLAN		12480
22S	REPORT PREPARATION		0
22S1	REAL ESTATE ACTIVITIES	0	
22S9	ALL OTHER ACTIVITIES	0	
22U	REAL ESTATE DESIGN MEMORANDUM		0
22V	REAL ESTATE PLANNING REPORT		0
24	MISCELLANEOUS		0
24A	REAL ESTATE ACTIVITIES	0	
24D	ALL OTHER	0	
25	COLLECTION AND STUDY OF BASIC DATA		0
25A	REAL ESTATE ACTIVITIES	0	
25D	ALL OTHER	0	
26	RESEARCH AND DEVELOPMENT		0
26A	REAL ESTATE ACTIVITIES	0	
26B	ALL OTHER	0	
27	REFORMULATION STUDIES		0
27A	REAL ESTATE ACTIVITIES	0	
27D	ALL OTHER	0	
			(R) $2,000
29	PROJECT COOPERATION AGREEMENTS (PCA)		$1,860
29A	DRAFT PCA		620
29A1	REAL ESTATE ACTIVITIES	620	
29A9	ALL OTHER ACTIVITIES	0	
29B	FINAL PCA AND FINANCIAL PLAN		620
29B1	REAL ESTATE ACTIVITIES	620	
29B9	ALL OTHER ACTIVITIES	0	
29C	PCA NEGOTIATIONS		620
29C1	REAL ESTATE ACTIVITIES	620	
29C9	ALL OTHER ACTIVITIES	0	
29D	TRANSFER OF PROJECT SPONSOR		0

				(R) $0	
51	OPERATION & MAINTENANCE DURING CONSTRUCTION			$0	
51A	REAL ESTATE LEASING		0		
51A1	INLEASING	0			
51A2	RELOCATION ASSISTANCE	0			
51A3	DISPOSAL ASSISTANCE	0			
51A4	RELOCATION ASSISTANCE PAYMENTS (PL 91-646)	0			
51A5	RENTS, INITIAL ALTERATIONS AND RESTORATIONS	0			
51B	REAL ESTATE MANAGEMENT SERVICES				0
51B1	INSPECTIONS		0		
51B1A	COMPLIANCE	0			
51B1B	UTILIZATION	0			
51B2	OUTGRANTS		0		
51B2A	REGULAR	0			
51B2B	OIL AND GAS	0			
51B3	DISPOSALS		0		
51B4	ENCROACHMENTS AND TRESPASS		0		
51C	OTHER OPERATION & MAINTENANCE EXPENSES		0		
51D	REVENUES FROM OUTLEASES RETURNED TO U.S.		0		
51E	AUDITS		0		
51F	TIMBER HARVEST		0		
51G	REPAYMENTS AND COST DISTRIBUTIONS		0		
51H	MISCELLANEOUS RECEIPTS		0		
51H1	REAL ESTATE MANAGEMENT INCOME	0			
51H9	OTHER INCOME	0			
52	SURVEYS AND LAYOUTS		0		
53	REAL ESTATE ADMINISTRATIVE ACTIVITIES		0		

CIVIL WORKS CHART OF ACCOUNTS
EAST BATON ROUGE TRIBUTARIES
MITIGATION

22 September 1994

				(R) $1,333,000
01	LANDS AND DAMAGES			$1,333,110
01A	PROJECT PLANNING		0	
01AX	CONTINGENCIES	0		
01B	ACQUISITIONS		14200	
01B1	BY GOVT	3960		
01B2	BY LOCAL SPONSOR (LS)	6230		
01B3	BY GOVT ON BEHALF OF LS	0		
01B4	REVIEW OF LS	1170		
01BX	CONTINGENCIES	2840		
01C	CONDEMNATIONS		2250	
01C1	BY GOVT	0		
01C2	BY LS	1240		
01C3	BY GOVT ON BEHALF OF LS	0		
01C4	REVIEW OF LS	560		
01CX	CONTINGENCIES	450		
01D	INLEASING		0	
01D1	BY GOVT	0		
01D2	BY LS	0		
01D3	BY GOVT ON BEHALF OF LS	0		
01D4	REVIEW OF LS	0		
01DX	CONTINGENCIES	0		
01E	APPRAISALS		9680	
01E1	BY GOVT (IN HOUSE)	0		
01E2	BY GOVT (CONTRACT)	0		
01E3	BY LS	6180		
01E4	BY GOVT ON BEHALF OF LS	0		
01E5	REVIEW OF LS	1560		
01EX	CONTINGENCIES	1940		
01F	PL 91-646 ASSISTANCE		940	
01F1	BY GOVT	0		
01F2	BY LS	560		
01F3	BY GOVT ON BEHALF OF LS	0		
01F4	REVIEW OF LS	190		
01FX	CONTINGENCIES	190		
01G	TEMPORARY PERMITS		5860	
01G1	BY GOVT	1730		
01G2	BY LS	2470		
01G3	BY GOVT ON BEHALF OF LS	0		
01G4	REVIEW OF LS	490		
01G5	OTHER	0		
01G6	DAMAGE CLAIMS	0		
01GX	CONTINGENCIES	1170		

01H	AUDITS		0	
01H1	BY GOVT	0		
01H2	BY LS	0		
01H3	BY GOVT ON BEHALF OF LS	0		
01H4	REVIEW OF LS	0		
01HX	CONTINGENCIES	0		
01J	ENCROACHMENTS AND TRESPASS		0	
01J1	BY GOVT	0		
01J2	BY LS	0		
01J3	BY GOVT ON BEHALF OF LS	0		
01J4	REVIEW OF LS	0		
01JX	CONTINGENCIES	0		
01K	DISPOSALS		0	
01K1	BY GOVT	0		
01K2	BY LS	0		
01K3	BY GOVT ON BEHALF OF LS	0		
01K4	REVIEW OF LS	0		
01KX	CONTINGENCIES	0		
01L	REAL PROPERTY ACCOUNTABILITY		0	
01LX	CONTINGENCIES	0		
01R	REAL ESTATE PAYMENTS			1288000
01R1	LAND PAYMENTS		1030000	
01R1A	BY GOVT	0		
01R1B	BY LS	1030000		
01R1C	BY GOVT ON BEHALF OF LS	0		
01R1D	REVIEW OF LS	0		
01R2	PL 91-646 ASSISTANCE PAYMENTS		0	
01R2A	BY GOVT	0		
01R2B	BY LS	0		
01R2C	BY GOVT ON BEHALF OF LS	0		
01R2D	REVIEW OF LS	0		
01R3	DAMAGE PAYMENTS		0	
01R3A	BY GOVT	0		
01R3B	BY LS	0		
01R3C	BY GOVT ON BEHALF OF LS	0		
01R3D	REVIEW OF LS	0		
01R9	OTHER		0	
01RX	CONTINGENCIES		258000	
01S	REAL ESTATE RECEIPTS		0	
01S1	DISPOSAL RECEIPTS-REIMBURSEMENTS(CR)-LANDS	0		
01S2	DISPOSAL RECEIPTS-GENERAL FUND(CR)-LANDS	0		
01T	LERRD CREDITS		12180	
01T1	LAND PAYMENTS	2780		
01T2	ADMINISTRATIVE COSTS	2780		
01T3	PL 91-646 ASSISTANCE	3480		
01T4	ALL OTHER	700		
01TX	CONTINGENCIES	2440		

			(R) $0
21	RECONNAISSANCE STUDIES		$0
21H	REAL ESTATE ACTIVITIES		0
21V	FEASIBILITY COST SHARING AGREEMENT		0
			(R) $12,000
22	FEASIBILITY STUDIES		$12,480
22H	REAL ESTATE PLAN		12480
22S	REPORT PREPARATION		0
22S1	REAL ESTATE ACTIVITIES	0	
22S9	ALL OTHER ACTIVITIES	0	
22U	REAL ESTATE DESIGN MEMORANDUM		0
22V	REAL ESTATE PLANNING REPORT		0
24	MISCELLANEOUS		0
24A	REAL ESTATE ACTIVITIES	0	
24D	ALL OTHER	0	
25	COLLECTION AND STUDY OF BASIC DATA		0
25A	REAL ESTATE ACTIVITIES	0	
25D	ALL OTHER	0	
26	RESEARCH AND DEVELOPMENT		0
26A	REAL ESTATE ACTIVITIES	0	
26B	ALL OTHER	0	
27	REFORMULATION STUDIES		0
27A	REAL ESTATE ACTIVITIES	0	
27D	ALL OTHER	0	
			(R) $0
29	PROJECT COOPERATION AGREEMENTS (PCA)		$0
29A	DRAFT PCA		0
29A1	REAL ESTATE ACTIVITIES	0	
29A9	ALL OTHER ACTIVITIES	0	
29B	FINAL PCA AND FINANCIAL PLAN		0
29B1	REAL ESTATE ACTIVITIES	0	
29B9	ALL OTHER ACTIVITIES	0	
29C	PCA NEGOTIATIONS		0
29C1	REAL ESTATE ACTIVITIES	0	
29C9	ALL OTHER ACTIVITIES	0	
29D	TRANSFER OF PROJECT SPONSOR		0

			(R) $0	
51	OPERATION & MAINTENANCE DURING CONSTRUCTION		$0	
51A	REAL ESTATE LEASING		0	
51A1	INLEASING	0		
51A2	RELOCATION ASSISTANCE	0		
51A3	DISPOSAL ASSISTANCE	0		
51A4	RELOCATION ASSISTANCE PAYMENTS (PL 91-646)	0		
51A5	RENTS, INITIAL ALTERATIONS AND RESTORATIONS	0		
51B	REAL ESTATE MANAGEMENT SERVICES			0
51B1	INSPECTIONS		0	
51B1A	COMPLIANCE	0		
51B1B	UTILIZATION	0		
51B2	OUTGRANTS		0	
51B2A	REGULAR	0		
51B2B	OIL AND GAS	0		
51B3	DISPOSALS		0	
51B4	ENCROACHMENTS AND TRESPASS		0	
51C	OTHER OPERATION & MAINTENANCE EXPENSES		0	
51D	REVENUES FROM OUTLEASES RETURNED TO U.S.		0	
51E	AUDITS		0	
51F	TIMBER HARVEST		0	
51G	REPAYMENTS AND COST DISTRIBUTIONS		0	
51H	MISCELLANEOUS RECEIPTS		0	
51H1	REAL ESTATE MANAGEMENT INCOME	0		
51H9	OTHER INCOME	0		
52	SURVEYS AND LAYOUTS		0	
53	REAL ESTATE ADMINISTRATIVE ACTIVITIES		0	

EXHIBIT "B"

ESTIMATE OF COSTS SUMMARY

The following is a summary of the updated estimates for the proposed project: (Date of Value - September 1994)

		Acres	Total Value
(a)	Lands and Damages		
	Fee	410.30	$ 1,030,013
	Perpetual Drainage Canal Easement	1,081.04	1,303,758
	Temporary Disposal Easement	21.0	1,000
	Temporary Construction Easement	30.47	9,750
	Total Lands (R)	1,542.81	2,345,000
	Improvements		10,000
	Severance Damages		737,000
	Total (R)		$ 3,092,000
(b)	Contingencies 25%* (R)		777,000
(c)	Total Estimated Lands and Damages (total project)		$ 3,869,000

*NOTE: Differences in above and individual estimate totals are due to rounding; the total of the separate estimates is $3,869,000.

ESTIMATE OF COSTS (Date of Value - September 1994)

		Acres	Unit Value	Total Value
(a)	Lands and Damages			
	Perpetual Drainage Canal Easement Channel	184.9	$ 1	$ 185
	Improvements			0
	Severance Damages			0
	Total (R)			$ 1,000
(b)	Contingencies 25% (R)			1,000
(c)	Total Estimated Real Estate Lands, Easements, Relocations, Right-of-Way, and Disposals (LERRDs)			$ 2,000

Jones Creek Watershed

ESTIMATE OF COSTS (Date of Value - September 1994)

(a) Lands and Damages	Acres	Unit Value	Total Value
Fee			
Channel	13.3	$ 1	$ 13
Perpetual Drainage Canal Easement			
Channel	358.5	1	359
Improvements			0
Severance Damages			0
Total (R)			$ 1,000
(b) Contingencies 25% (R)			1,000
(c) Total Estimated Real Estate Lands, Easements, Relocations, Right-of-Way, and Disposals (LERRDs)			$ 2,000

Beaver Bayou

ESTIMATE OF COSTS (Date of Value - September 1994)

	Acres	Unit Value	Total Value
(a) Lands and Damages			
Existing Channel R/W			
Residential	7	$ 5,000	$ 35,000
Channel	3.5	1	4
Perpetual Drainage Canal Easement			
Agricultural	39.1	1,600	62,560
Agricultural/Potential Residential	33.7	3,000	101,100
Residential	47.6	4,000	190,400
Residential	13.0	10,000	130,000
Improvements (Bulkhead)			10,000
Severance Damages			369,000
Total (R)			$ 898,000
(b) Contingencies 25% (R)			225,000
(c) Total Estimated Real Estate Lands, Easements, Relocations, Right-of-Way, and Disposals (LERRDs)			$1,123,000

Bayou Fountain

ESTIMATE OF COSTS (Date of Value - September 1994)

(a) Lands and Damages	Acres	Unit Value	Total Value
Perpetual Drainage Canal Easement			
Low Wood and Open Land (New R/W)	121.95	1,600	195,120
Low Wood and Open Land (Owned by Local Sponsor)	9.1	1,600	14,560
Channel	3.59	$ 1	$ 4
Temporary Construction Easement (2 Years)			
Low Wood and Open Land	30.47	1,600 x.20	9,750
Improvements			0
Severance Damages*			44,000
Total (R)			$ 263,000
(b) Contingencies 25% (R)			66,000
(c) Total Estimated Real Estate Lands, Easements, Relocations, Right-of-Way, and Disposals (LERRDs)			$ 329,000

*This severance estimate addresses those tracts which may lose access or suffer diminution in value to remainders. Since there are no private bridges on Bayou Fountain, the estimated severance damages have no costs associated with private bridge replacement.

Blackwater Bayou (Includes Blackwater Bayou Tributary No. 1)

ESTIMATE OF COSTS (Date of Value - September 1994)

(a) Lands and Damages	Acres	Unit Value	Total Value
Existing Channel R/W			
Channel	16.2	$ 1	$ 16
Wet Woodland	21.0	$ 250	$ 5,250
Perpetual Drainage Canal Easement			
Wet Woodland	12.0	500	$ 6,000
Agricultural	94.0	1,600	150,400
Agricultural/Potential Residential	80.8	3,000	242,400
Residential	30.1	4,000	120,400
Residential	5.0	10,000	50,000
Improvements			0
Severance Damages			324,000
Total (R)			$ 898,000
(b) Contingencies 25%			225,000
(c) Total Estimated Real Estate Lands, Easements, Relocations, Right-of-Way, and Disposals (LERRDs)			$1,123,000

HUBBS ROAD (Mitigation Site)

ESTIMATE OF COSTS (Date of Value - September 1994)

(a)	Lands and Damages	Acres	Unit Value	Total Value
	Fee Excluding Minerals Agricultural/Potential Residential	282	$ 3,000	$ 846,000
	Improvements			0
	Severance Damages			0
	Total (R)			$ 846,000
(b)	Contingencies 25% (R)			212,000
(c)	Total Estimated Real Estate Lands, Easements, Relocations, Right-of-Way, and Disposals (LERRDs)			$1,058,000

BURBANK DRIVE NEAR SIEGEN LANE (Mitigation Site)

ESTIMATE OF COSTS (Date of Value - September 1994)

		Acres	Unit Value	Total Value
(a)	Lands and Damages			
	Fee Excluding Minerals Low Woodland and Open Land	115	$ 1,600	$ 184,000
	Improvements			0
	Severance Damages			0
	Total (R)			$ 184,000
(b)	Contingencies 25% (R)			46,000
(c)	Total Estimated Real Estate Lands, Easements, Relocations, Right-of-Way, and Disposals (LERRDs)			$ 230,000

MISSISSIPPI RIVER BATTURE (Disposal Area)

ESTIMATE OF COSTS (Date of Value - September 1994)

(a) Lands and Damages	Acres	Unit Value	Total Value
Temporary Disposal Easement (4 years) R/W over Existing Borrow Easement	21	Nominal	$ 1,000
Improvements			0
Severance Damages			0
Total (R)			$ 1,000
(b) Contingencies 25% (R)			1,000
(c) Total Estimated Real Estate Lands, Easements, Relocations, Right-of-Way, and Disposals (LERRDs)			$ 2,000

EXHIBIT "C"

ACQUISITION SCHEDULE

ACTIVITY	COE INITIATE	COE COMPLETE	LS INITIATE	LS COMPLETE
FORMAL TRANSMITTAL OF FINAL ROW DRAWINGS TO ACQUIRE LERRD	01/Jan/96	11/Jan/96		
PREPARE MAPPING AND LEGAL DESCRIPTIONS			11/Jan/96	31/Mar/96
REVIEW MAPPING AND LEGAL DESCRIPTIONS	31/Mar/96	10/Apr/96		
OBTAIN TITLE EVIDENCE			10/Apr/96	23/Aug/96
REVIEW TITLE EVIDENCE	23/Aug/96	07/Sep/96		
OBTAIN TRACT APPRAISALS			10/Apr/96	08/Aug/96
REVIEW TRACT APPRAISALS	08/Aug/96	18/Aug/96		
CONDUCT NEGOTIATIONS			18/Aug/96	16/Nov/96
PERFORM CLOSINGS			18/Aug/96	16/Dec/96
PREPARE CONDEMNATIONS			18/Aug/96	17/Sep/96
REVIEW CONDEMNATIONS	17/Sep/96	17/Oct/96		
PERFORM CONDEMNATIONS			17/Oct/96	16/Nov/96
OBTAIN POSSESSION			16/Nov/96	16/Dec/96
COMPLETE PL 91-646 BENEFITS ASSISTANCE			18/Aug/96	16/Dec/96
REVIEW PL 91-646 PAYMENTS	16/Dec/96	31/Dec/96		
CERTIFY ALL NECESSARY LERRD IS AVAILABLE FOR CONSTRUCTION	31/Dec/96	05/Jan/97		
PREPARE AND SUBMIT CREDIT REQUESTS			05/Jan/97	06/Mar/97
REVIEW CREDIT REQUESTS	06/Mar/97	15/Apr/97		
APPROVE OR DENY CREDIT	15/Apr/97	15/May/97		
ESTABLISH VALUE FOR CREDITABLE LEERD IN F&A COST ACCOUNTING SYSTEM	15/May/97	30/May/97		

EXHIBIT "C"

EXHIBIT "D"

Office of the Parish Attorney

City of Baton Rouge
Parish of East Baton Rouge

222 St. Louis Street
Post Office Box 1471
Baton Rouge, Louisiana
70821

504/389-3114
504/389-5554 (FAX)

MICHAEL E. PONDER
Parish Attorney

September 19, 1994

Mr. Falcolm E. Hull, BAS/SPEC Plng. Sec.
CELMN-PD-FB
Department of The Army
New Orleans District Corp of Engineers
Post Office Box 60267
New Orleans, LA 70160-0267

RE: Use of the Louisiana Department of Transportation and Development's Quick Take Expropriation Provisions by the City of Baton Rouge and the Parish of East Baton Rouge

Dear Mr. Hull:

Attached are copies of Resolution 34132 and the latest Local Services Agreement between the Parish of East Baton Rouge and the City of Baton Rouge wherein the City and Parish availed themselves of the Local Services Law provisions of Chapter 2 of Title 33 of the Louisiana Revised Statues, (LSA-R.S. 33:1321 - 1337) to enter into a local services agreement between themselves to plan, finance, construct, acquire and/or improve public projects, servitudes, right-of-ways, easements, streets and roads within the Parish of East Baton Rouge and/or the City of Baton Rouge.

LSA-R.S.33:1329 grants the City-Parish the right to use procedures outlined and provided for in LSA-R.S.48:1259, where condemnation is necessary. LSA-R.S.48:1259 states that the proceedings to be used for condemnation are those which are set out in LSA-R.S.48:441-460, the Louisiana Department of Transportation and Development's quick take provisions.

Since 1989 the City-Parish and/or Commissions established by the City-Parish under the local services act have used the quick take statutes in numerous proceedings to acquire servitudes and fee title ownership for sewage projects, and road projects. Although attorneys representing defendants have questioned our use of the quick take, none have challenged its use once the above statutes have been brought to their attention. Any expropriations that are needed for the Corps' drainage project will be by

the quick take method as authorized by the statues in the local services agreement.

If you have any questions please advise.

Sincerely yours,

Larry D. Book
Special Assistant Parish Attorney

LDB:lsg

Attachment

A:Hull.ltr

607

RESOLUTION 34132

A RESOLUTION AUTHORIZING THE JOINT UNDERTAKING BY THE PARISH OF EAST BATON ROUGE, STATE OF LOUISIANA WITH THE CITY OF BATON ROUGE, STATE OF LOUISIANA, TO PLAN, FINANCE, CONSTRUCT, ACQUIRE, AND/OR IMPROVE PUBLIC PROJECTS, SERVITUDES, RIGHT-OF WAYS, EASEMENTS, STREETS AND ROADS WITHIN THE PARISH OF EAST BATON ROUGE AND/OR THE CITY OF BATON ROUGE); AUTHORIZING THE EXECUTION OF THE LOCAL SERVICES AGREEMENT PROVIDING FOR SAID JOINT UNDERTAKING IN ACCORDANCE WITH THE PROVISIONS OF THE LOCAL SERVICES LAW; AND PROVIDING FURTHER MATTERS IN CONNECTION HEREWITH.

WHEREAS, it is provided in Article 6, Section 20 of the Louisiana Constitution of 1974 and the Local Services Law (Part VII, Chapter 2, Title 33 of the Louisiana Revised Statutes of 1950, as amended), that, to the end that, through the use of the arrangements provided therein, greater economy and efficiency in the operation of local services may be encouraged and the benefits of such services extended, municipalities, parishes and political subdivisions of the State of Louisiana, or any combination thereof, may make agreements between and among themselves to engage jointly in the exercise of any power or function, including the planing, financing, construction, acquisition and/or improvement of any public project or improvements or the promotion of any undertaking which any of the participating entities may exercise under the provisions of general or specific laws, including specifically the planing, financing, construction, acquisition, and/or improvement of public projects, servitudes, right-of ways, easements, streets and roads within the Parish of East Baton Rouge and/or the City of Baton Rouge); and

WHEREAS, the Parish of East Baton Rouge, State of Louisiana (the "Parish") and the City of Baton Rouge, State of Louisiana (the "City") have specific and general powers and authority under Chapter 2 of Title 33 of the Louisiana Revised Statutes of 1950, as amended, and other constitutional and statutory authority supplemental thereto, including the power to plan, finance, construct, acquire, and/or improve public projects, servitudes, right-of ways, easements, streets and roads within the

City of Baton Rouge and the Parish of East Baton Rouge; and

WHEREAS, it would be in the best interest of the City and the Parish to participate in the joint undertakings hereinafter described; and

WHEREAS, in order to meet its respective needs and in order to obtain the benefits of joint planning, financing, construction, acquisition and/or improvement of public projects, servitudes, right-of ways, easements, streets and roads within the City of Baton Rouge and the Parish of East Baton Rouge, the Parish and City intend to engage in a joint undertakings under the provisions of the above described authorities to plan, finance, construct, acquire and/or improve public projects, servitudes, right-of ways, easements, streets and roads within the City of Baton Rouge and the Parish of East Baton Rouge; and

WHEREAS, the Parish and City propose to enter into a joint agreement providing for said joint undertakings; and

WHEREAS, the Parish and City intend that such agreement constitute a Local Service Agreement under the provisions of the Local Services Law;

NOW, THEREFORE, BE IT RESOLVED by the Metropolitan Council of the City of Baton Rouge and the Parish of East Baton Rouge, Louisiana (the "Metropolitan Council"), acting as the governing authority of the City and Parish, as follows:

Section 1. That pursuant to Article 6, Section 20 of the Louisiana Constitution of 1974 and the Local Services Law (Part VII, Chapter 2, title 33 of the Louisiana Revised Statutes of 1950, as amended), there be and there is hereby authorized a joint undertaking by the City of Baton Rouge and the Parish of East Baton Rouge, State of Louisiana, to plan, finance, construct, acquire, and/or improve public projects, servitudes, right-of ways, easements, streets and roads within the City of Baton Rouge and the Parish of East Baton Rouge.

Section 2. That in compliance with the aforesaid constitutional and statutory authority, the Mayor-President and the Mayor Pro-Tempore, for, on behalf of and in the name of the City of

Baton Rouge and the Parish of East Baton Rouge, State of Louisiana, be and they are hereby authorized, empowered and directed to execute a Local Services Agreement setting forth the terms and conditions for the implementation of the joint undertaking, which agreement shall be in substantially the form attached hereto as Exhibit A

Section 3. That a certified copy of this resolution shall be furnished to the other party to the Local Services Agreement. Another certified copy shall be recorded in mortgage records of the Parish and an additional copy of the resolution shall be published in the official journal of the Parish.

Section 4. That the Mayor-President and the Mayor Pro-Tempore are hereby authorized and directed on behalf of the City of Baton Rouge and the Parish of East Baton Rouge, State of Louisiana, to execute any and all documents and to take such further actions as may be incidental or necessary to affect or promote the joint undertaking and to carry out the terms and purposes of the joint undertaking as more fully described in the Local Services Agreement hereinabove set out.

Section 5. This resolution shall be interpreted liberally, to the end that through the use of arrangements provided herein, greater economy and efficiency of operation of the joint undertaking may be encouraged, and the benefits of such undertaking may be extended in the best interest of the citizens of the Members and the State of Louisiana.

Section 6. This resolution shall take effect immediately.

CITY OF BATON ROUGE AND
PARISH OF EAST BATON ROUGE

By: ______________________
TOM ED MCHUGH
MAYOR-PRESIDENT

By: ______________________
DONALD NIJOKA
COUNCIL ADMINISTRATOR-TREASURER

(a:inter-gov.res)

LOCAL SERVICES AGREEMENT

UNITED STATE OF AMERICA
STATE OF LOUISIANA
PARISH OF EAST BATON ROUGE

BE IT KNOWN that on this _________ day of _________________, 1993, before me the undersigned Notary Public, duly commissioned and qualified in and for the Parish and State aforesaid, therein residing and in the presence of the undersigned competent witnesses:

PERSONALLY CAME AND APPEARED:

(1) THE PARISH OF EAST BATON ROUGE, STATE OF LOUISIANA (the "Parish"), appearing by and through Tom Ed McHugh, the Mayor-President, and Lynda Imes, the Mayor-President Pro-Tempore, duly authorized by resolution of the Metropolitan Council of the City of Baton Rouge and Parish of East Baton Rouge, Louisiana (the "Metropolitan Council"), adopted at a meeting held on the ________ day of _____________________, 1993, a certified copy of which is annexed hereto; and

(2) THE CITY OF BATON ROUGE, STATE OF LOUISIANA (the "City"), appearing by and through Tom Ed McHugh, the Mayor-President, and Lynda Imes, the Mayor-President Pro-Tempore, duly authorized by resolution of the Metropolitan Council adopted at a meeting held on the __________ day of ____________________, 1993, a certified copy of which is annexed hereto;

WHO DECLARED, that the Parish and the City (hereinafter sometimes collectively referred to as "Members"), are political subdivisions organized under the laws of the State of Louisiana, and that availing themselves of the provisions of Chapter 2 of Title 33 of the Louisiana Revised Statutes of 1950, as amended, LRS 33:1321-1337, inclusive (the "Local Services Law") and other constitutional and statutory authority supplemented thereto, they do by these presents enter into the following Local Services Agreement between themselves, for the objects and purposes and under the conditions, covenants and stipulations of the following agreement, to-wit:

ARTICLE 1
AGREEMENT

1.1 The Members are joining together (i) to plan, finance, construct, acquire and/or improve public projects, servitudes, right-of-ways, easements, streets and roads within the Parish of East Baton Rouge and/or the City of Baton Rouge; (ii) to obtain the benefits of joint planning and coordination in the performance, provisions, fulfillment and exercise of such activities, services, obligations, powers and duties; (iii) to share equitably the savings, operating and financial benefits which accrue from the joint exercise of such activities, services , powers, duties and obligations; (iv) to operate and maintain such public projects or improvements necessary or incidental thereto, and (v) to avail themselves of the method of acquisition of public projects, servitudes, right-of-ways, easements, streets and roads within the Parish of East Baton Rouge and/or the City of Baton Rouge specifically allowed in LRS 33:1229, all for and on behalf of the residents of the Members.

ARTICLE II
DEFINITIONS

2.1 The term "Agreement" or "Local Services Agreement" as used herein, shall mean and refer to this document.

2.2 The term "Metropolitan Council" shall mean the Metropolitan Council of the City of Baton Rouge and Parish of East Baton Rouge, Louisiana, or its successor.

ARTICLE III
INTENT

3.1 It is the intention of the Members that this Agreement constitute a Local Services Agreement under the provisions of the Local Services Law.

ARTICLE IV
JOINT UNDERTAKING

4.1 The Members hereby agree that the City will perform those specific activities, services, powers, duties and obligations required to be performed by the City in accordance with the Plan of Government and the provisions of the Louisiana Revised Statutes of 1950, as amended, and the Parish will perform those specific activities, services, powers, duties and obligations required to be performed by the Parish in accordance with the Plan of Government and the provisions of the Louisiana Revised Statutes of 1950, as amended.

4.2 The City and Parish acknowledge that those certain activities, services, powers, duties and/or obligations are required to be performed by the City and/or Parish in accordance with the Plan of Government and general or special laws of the State of Louisiana and that this Local Services Agreement provides greater economy and efficiency in completing such undertakings.

ARTICLE V
DURATION

5.1 This Local Services Agreement shall remain in full force and effect until such time as each of the Members agrees to terminate this Local Services Agreement by Resolution of each of the Members.

ARTICLE VI
AMENDMENT

6.1 This Local Services Agreement may be amended within the limitations prescribed by law by resolution of each of the Members.

ARTICLE VII
LIBERAL INTERPRETATION

7.1 This Local Services Agreement shall be interpreted liberally, to the end that through the use of arrangements provided herein, greater economy and efficiency of operation of the joint undertaking may be encouraged, and the benefits of such joint undertaking may be extended in the best interest of the citizens of the Members and the State of Louisiana, all as provided in the Local Services Law.

ARTICLE VIII
SEVERABILITY

8.1 If any one or more of the provisions of this Local Services Agreement shall be declared to be contrary to law by any part of competent jurisdiction, then such provision or provisions shall be null and void and shall be deemed separable from the containing provisions of this Local Services Agreement and shall in no way affect the validity of the other provisions of this Local Services Agreement.

THUS DONE AND PASSED in multiple originals in Baton Rouge, Louisiana on this _______ day of _________________________, 1993, in the presence of the undersigned competent witnesses, who have hereunto signed their names with the said appearers and me, Notary, after due reading of the whole.

PARISH OF EAST BATON ROUGE,
STATE OF LOUISIANA

ATTEST:

______________________________ ______________________________

Lynda Imes
Mayor-President Pro-Tempore

Tom Ed McHugh
Mayor-President

CITY OF BATON ROUGE,
STATE OF LOUISIANA

ATTEST:

______________________________ ______________________________

Lynda Imes
Mayor-President Pro-Tempore

Tom Ed McHugh
Mayor-President

WITNESSES TO ALL:

____

____

____
NOTARY PUBLIC

(f:localserv.agr)

FEE EXCLUDING MINERALS (With Restriction on Use of Surface)

The fee simple title to the land described, subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines; excepting and excluding from the taking all coal, oil, gas and other minerals, in and under said land and all appurtenant rights for the exploration, development, production and removal of said coal, oil, gas and other minerals, but without the right to enter upon or over the surface of said land for the purpose of drilling and extracting therefrom said coal, oil, gas and other minerals.

DRAINAGE CANAL EASEMENT

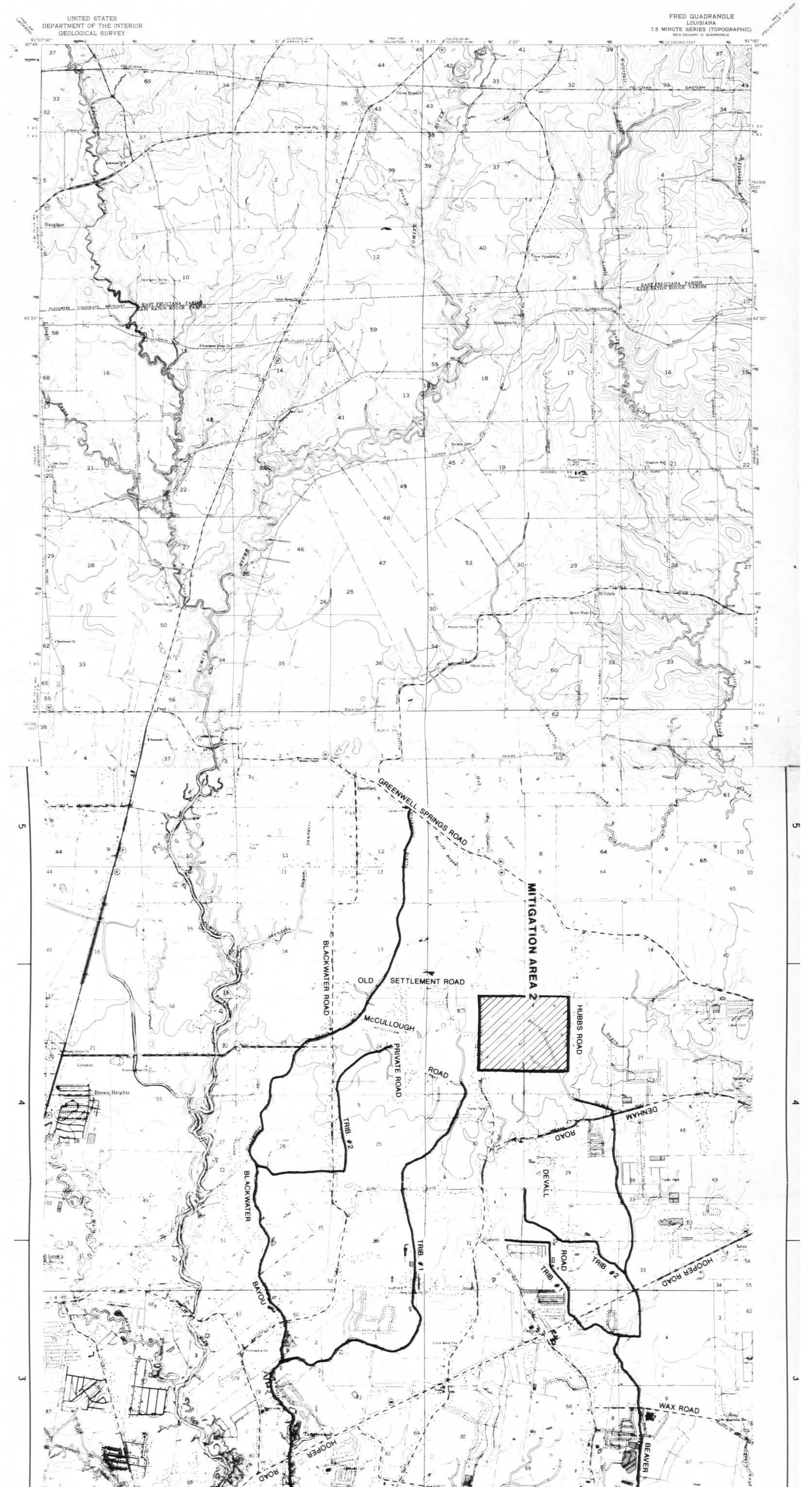
A perpetual and assignable easement and right-of-way in, over and across the land described to construct, maintain, repair, operate, patrol and replace a drainage ditch, reserving, however, to the owners, their heirs and assigns, all such rights and privileges in the land as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

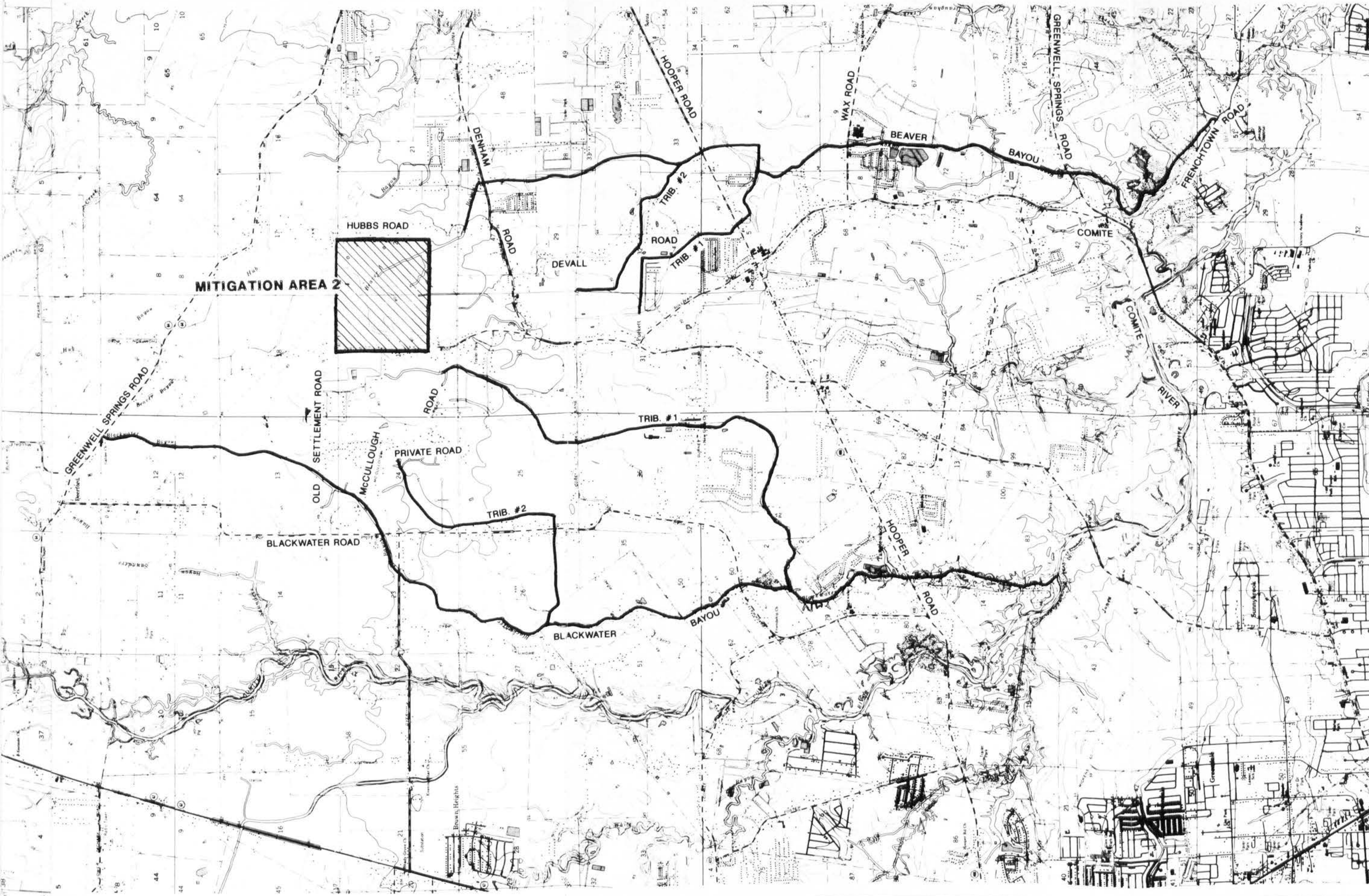
TEMPORARY CONSTRUCTION EASEMENT

A temporary easement and right-of-way in, on, over and across the land described, for a period not to exceed two (2) years, beginning with date possession of the land is granted to the _______________, for use by the ___________________, the United States, its representatives, agents, and contractors as a construction or work area, including the right to borrow and/or deposit fill and excavated material thereon; move, store and remove equipment and supplies, and erect and remove temporary structure on the land and to perform any other work necessary and incident to the construction of the Project, together with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions, and any other vegetation, structures, or obstacles within the limits of the right-of-way; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

DREDGED MATERIAL DISPOSAL EASEMENT

An assignable and exclusive right, servitude, and easement in, on, over, and across those lands described in Schedule A for a period not to exceed four years from the date hereof, to construct, operate, and maintain a dredged material disposal area on the land hereinafter described, including the right to construct dikes and to install, alter, relocate, repair or plug cuts in the banks of said dikes; to deposit dredged material thereon; to accomplish any alterations of contours on said land for the purpose of accommodating the deposit of dredged materials as necessary in connection with such work; to clear, trim, cut, fell, and remove therefrom any or all trees, timber, underbrush, obstructions, and any other vegetation, structures, or obstacles as required in connection with said work; to clear, borrow, excavate, and remove therefrom all soil, dirt, and any other materials, including dredged material, as required in connection with said work; to plant or cause the growth of vegetation on said land; and to undertake any management practices designed to enhance the use of or extend the life of said land for the deposit of dredged material; and to create, restore, nourish, and enhance the wetlands in, over, across, and upon the said lands; provided that no structures for human habitation shall be constructed or maintained on the land, and that no other structures shall be constructed or maintained on the land without the prior written approval of the District Engineer of the U. S. Army Engineer District, New Orleans, or authorized representative, and that no excavation shall be conducted and no disposal of any kind placed on the lands without such approval, including approval of the location and method of excavation and/or placement of disposal; the above estate is taken subject to existing easements for public roads and highways, public utilities, railroads and pipelines; reserving, however, to the Grantor, its successors and assigns, all such rights and privileges in said land as may be used and enjoyed without interfering with or abridging the use of the project for the purposes authorized by Congress or the rights, servitudes, and easements hereby acquired.


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
FRED QUADRANGLE
LOUISIANA
7.5 MINUTE SERIES (TOPOGRAPHIC)
EAST FELICIANA PARISH
EAST BATON ROUGE PARISH
Slaughter
Olive Branch
Milldale
Fred
Deerford
Brown Heights
GREENWELL SPRINGS ROAD
MITIGATION AREA 2
BLACKWATER ROAD
OLD SETTLEMENT ROAD
McCULLOUGH ROAD
PRIVATE ROAD
HUBBS ROAD
DENHAM ROAD
TRIB. #2
TRIB. #1
BLACKWATER BAYOU
DEVALL ROAD
HOOPER ROAD
WAX ROAD
BEAVER



AMITE RIVER AND TRIBUTARIES FLOOD CONTROL
EAST BATON ROUGE PARISH FEASIBILITY STUDY

BLACKWATER BAYOU,
BEAVER BAYOU
AND TRIBUTARIES

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY: FV	PLOT SCALE: AS SHOWN	PLOT DATE: N/A	CADD FILE: N/A
DRAWN BY: LMP			FILE NO.
CHECKED BY: FV	DATE: SEPTEMBER 1994		H-4-40273

PLATE 1

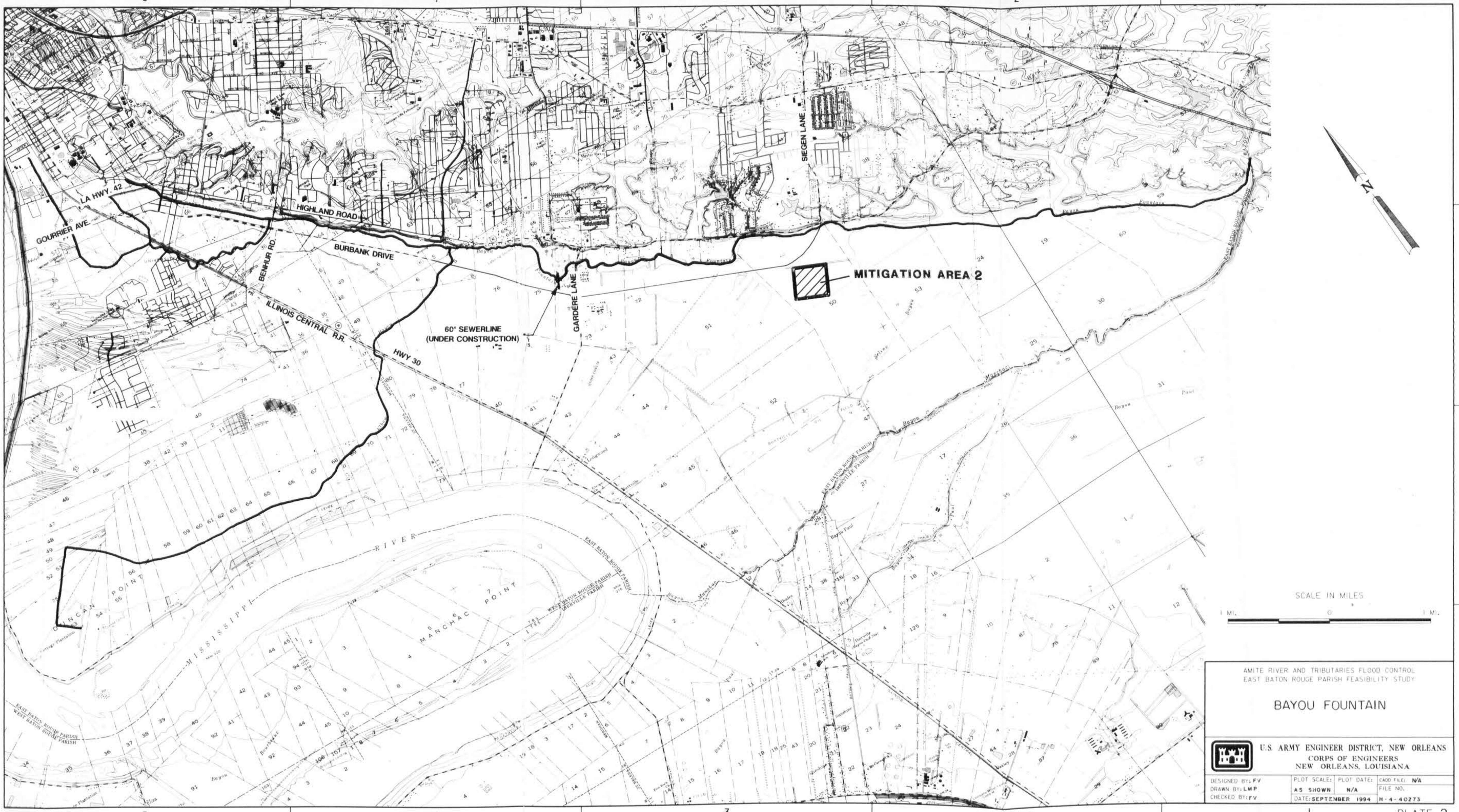
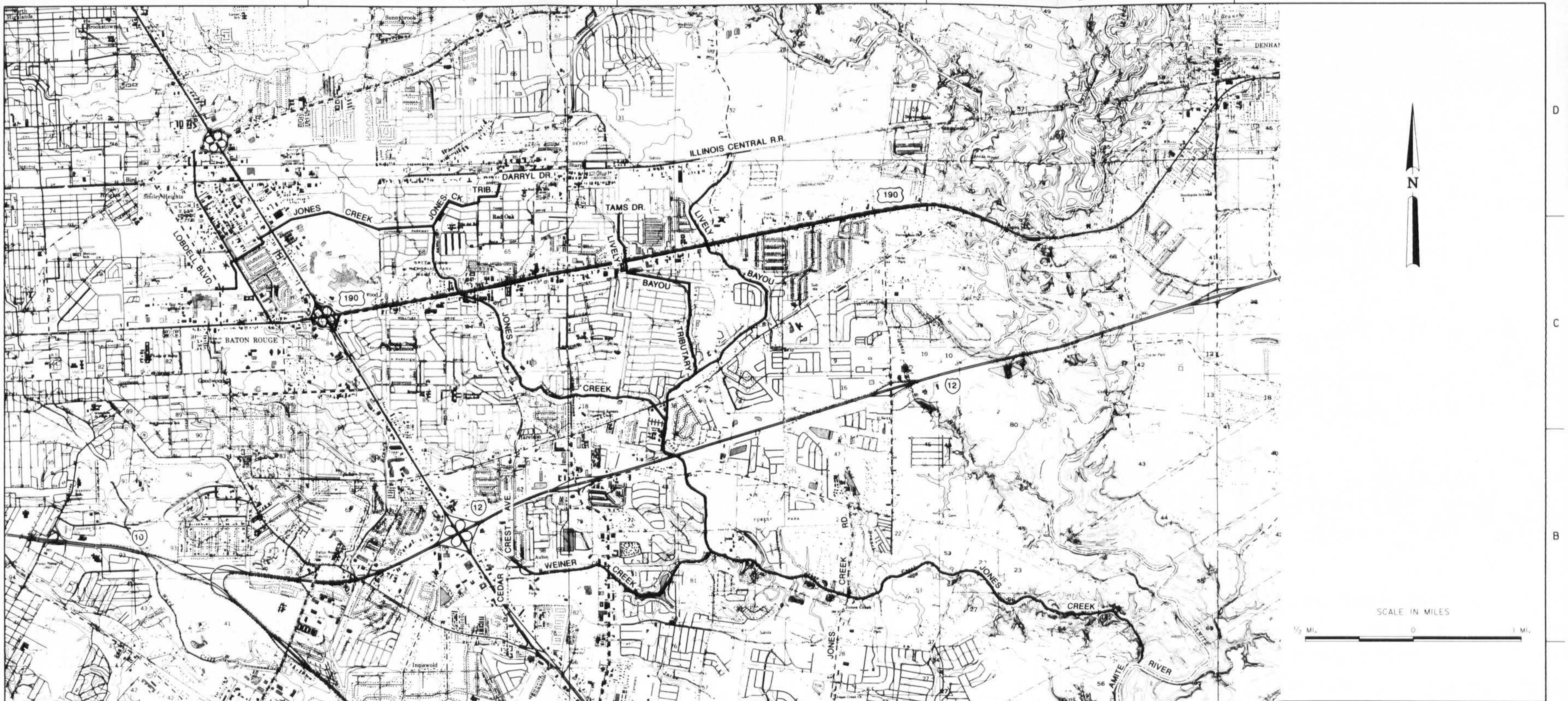

LA HWY. 42
GOURRIER AVE.
HIGHLAND ROAD
BURBANK DRIVE
BENHUR RD.
ILLINOIS CENTRAL R.R.
HWY 30
60" SEWERLINE
(UNDER CONSTRUCTION)
GARDERE LANE
SIEGEN LANE
MITIGATION AREA 2
MISSISSIPPI
RIVER
MANCHAC POINT
DUNCAN POINT
EAST BATON ROUGE PARISH
WEST BATON ROUGE PARISH
IBERVILLE PARISH
Bayou Fountain
Bayou Manchac
Bayou Paul
N
SCALE IN MILES
1 MI. 0 1 MI.
AMITE RIVER AND TRIBUTARIES FLOOD CONTROL
EAST BATON ROUGE PARISH FEASIBILITY STUDY
BAYOU FOUNTAIN
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA
DESIGNED BY: FV
DRAWN BY: LMP
CHECKED BY: FV
PLOT SCALE: AS SHOWN
PLOT DATE: N/A
DATE: SEPTEMBER 1994
CADD FILE: N/A
FILE NO. H-4-40273

PLATE 2



AMITE RIVER AND TRIBUTARIES FLOOD CONTROL
EAST BATON ROUGE PARISH FEASIBILITY STUDY

JONES CREEK AND TRIBUTARIES

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

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PLATE 3

AMITE RIVER AND TRIBUTARIES FLOOD CONTROL
EAST BATON ROUGE PARISH FEASIBILITY STUDY

WARD CREEK AND TRIBUTARIES

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

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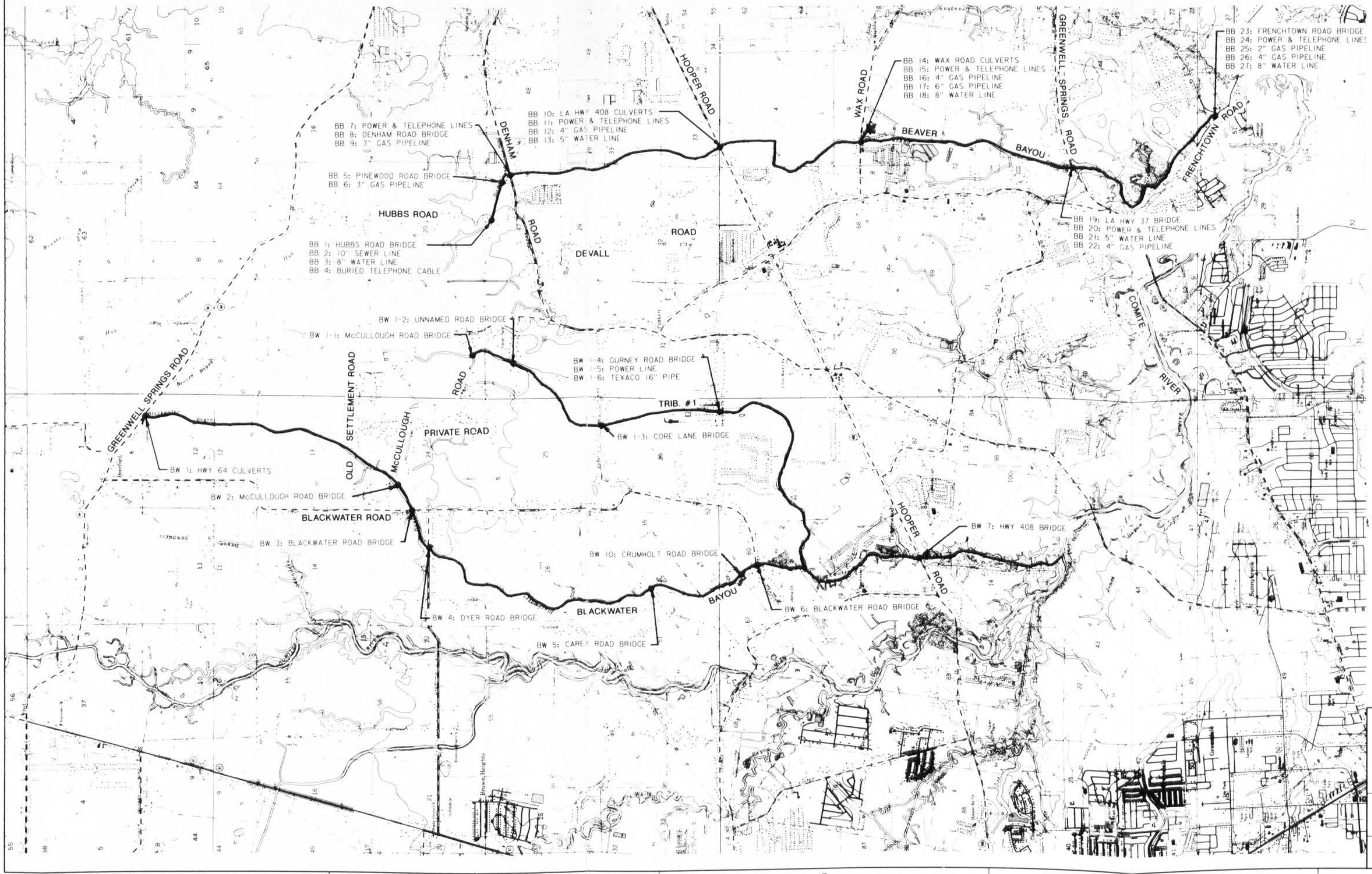
PLATE 4



N

AMITE RIVER & TRIBUTARIES
EAST BATON ROUGE PARISH

Beaver Bayou
Blackwater Bayou and Tributaries

Legend:

BB - Beaver Bayou
BW - Blackwater Bayou
BW1 - Blackwater Bayou Tributary #1

NOTE: LOCATIONS OF FACILITIES DEPICTED ON THIS CHART ARE APPROXIMATE.

Revised by CELMN-ED-SR, 21 Jul 94.

SCALE IN MILES

1 MI. 0 1 MI.

AMITE RIVER AND TRIBUTARIES FLOOD CONTROL
EAST BATON ROUGE PARISH FEASIBILITY STUDY

BLACKWATER BAYOU,
BEAVER BAYOU
AND TRIBUTARIES

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY: FV	PLOT SCALE: AS SHOWN	PLOT DATE: N/A	CADD FILE: N/A
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CHECKED BY: FV	DATE: SEPTEMBER 1994		H-4-40273

PLATE 5

APPENDIX J

LAND USE ANALYSIS

LAND USE ANALYSIS

Historical land use for 1954, 1972, 1978, and 1985 are shown in Tables 3, 4, 5, and 6 of the main report. A geographic information system (GIS) was used to map historical land use changes. The methodologies used to map historical land use and project future land use are described in this appendix.

The hydrologic and hydraulics, land use and economic analyses were conducted on a subbasin level. The land use analysis was to determine the extent of induced development that may occur as a result of implementation of a flood control project. It was assumed that the major impacts would be limited to those areas within the basin where alternative plans would cause substantial stage lowerings (greater than 1 foot) or areas where the floodplain would change measurably. The following subbasins were analyzed in the Comite River Basin.

SUBBASIN NUMBER	SUBBASIN NAME
1	Bayou Baton Rouge
2	Upper Cypress Bayou
3	Upper White Bayou
4	Redwood Creek
5	Comite River above Redwood Creek
6	Lively Bayou
7	South Canal & Cypress Bayou
8	Comite River Vicinity of Dyer Road
9	Baker and South Canal
10	Cypress Bayou
11	Cypress Bayou Extension
12	White Bayou
13	Blackwater Bayou
14	Beaver Bayou
15	Monte Sano Bayou
16	Hurricane Creek
17	Comite River vicinity Jones Creek
18	Comite River Near Shoe Creek
19	Comite River Near Draughn Creek

The data indicates that between 1972 and 1978 about 51 percent of the urban growth occurred within the 100 year floodplain at the expense of agricultural and forest lands. Between 1978 and 1985 about 42 percent of the urban growth occurred within the 100 year floodplain. Over the longer period 1972- 1985 urban development within and outside the floodplain grew at about the same rate.

Subbasins along the Amite River where stage lowerings were about a foot or less and were considered in the analysis are shown below.

SUBBASIN NUMBER	SUBBASIN NAME
29	Bayou Fountain
31	Clay Cut Bayou
32	Lower Ward Creek
42	Amite River Diversion Canal
43	Muddy Creek
44	Amite River at Port Port
47	Amite River below Denham Springs
48	Honey Cut Bayou
51	Upper Amite River
60	Bayou Manchac

In these subbasins along the Amite River, most of the urban growth has been outside the 100 year floodplain. Data on urban growth between 1972 and 1985 is shown below.

PERCENT LAND USE CHANGES IN SELECTED SUBBASINS IN THE STUDY AREA

1972-1978		1978-1985		1972-1985	
Within 100 Year Fldplain	Outside 100 Year Fldplain	Within 100 Year Fldplain	Outside 100 Year Fldplain	Within 100 year Fldplain	Outside 100 year Fldplain
34	66	30	70	32	68

Historical data indicate that the development has occurred in the Comite River Basin without regard to location of the 100 year floodplain. The location of the 100 year floodplain has not been major factor in determining where development occurred. The Comite River Basin based on the future land use projection will not be a major growth area because transportation routes are not well developed and the area is quite a distant from major employers. Urban acres in subbasins 1- 19 are expected to increase by about 11,000 by the year 2040. The increase of about 11,000 is only 13 percent of the total growth of the area. In the subbasins along the Amite River, urban acres are expected to increase by about 33,000 acres by the year 2040. This increase is

about 41 percent of the total growth of the area. The total number of acres converted to urban lands within a subbasin would not change with the implementation of a flood control project. No reallocation of urban growth from one basin to another would occur. The implementation of the Comite River Diversion Plan would result in about 8,100 acres being removed from the 100 year floodplain within the Comite River Basin. In the study area about 13,000 acres would no longer be within the 100 year floodplain. This is only about 4 percent of the total number of acres located within the 100 year floodplain.

In the studies that were conducted by LSU Remote Sensing Laboratory and the State Planning Office, the plan designations are not the same as those contained the other parts of this report and EIS. The plans were originally designated on the basis of a level of protection. However, this is misleading because the levels of protection vary at different location for each plan. To avoid confusion, the plan designations were changed. The new designations are given below

OLD DESIGNATION	NEW DESIGNATION
10 YR Comite River Diversion	12,700 cfs Diversion
25 YR Comite River Diversion	19,600 cfs Diversion
50 YR Comite River Diversion	31,500 cfs Diversion
100 YR Comite River Diversion	41,000 cfs Diversion
10 YR Channel Modification	24,500 cfs Channel Modification
25 Yr Channel Modification	32,500 cfs Channel Modification
50 Yr Channel Modification	42,000 cfs Channel Modification
100 yr Channel Modification	51,000 cfs Channel Modification

FINAL REPORT

Historical Land-Cover Change Mapping
for Floodplain Management Within
the Amite River Basin, Louisiana
(RSIP T.R. 3.01.87)

by

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Submitted to

U.S. Army Corps of Engineers
New Orleans District
New Orleans, Louisiana

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The authors express appreciation to Mr. Kevin Marshall (RSIP) for assistance in the various computer programming tasks required by this project. Mr. William Bush (RSIP) was responsible for the digitizing of the majority of the maps used to generate the results of this project. Mr. Thang Huynh and Ms. Raelon Harlow assisted in the editing of mapped products. Ms. Cindy Cangiolosi and the typing staff at RSIP were responsible for the word processing of this report. Appreciation is also given to the contract technical officer, Mr. Falcolm Hull (COE) for his assistance and cooperation throughout the course of this project.

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TABLE OF CONTENTS

Historical Land-Cover Change Mapping for Floodplains Management Within the Amite River Basin, Louisiana

1. INTRODUCTION

Numerous areas along the Amite River Basin, Louisiana, have experienced costly flooding in recent years. The U.S. Army Corps of Engineers (COE) is investigating the feasibility of providing improvements for flood control in the Amite River Basin. This project was conducted in order to map land-cover changes (1954/61-85) by sub-basin within the Amite River watershed that is under study by the Corps of Engineers (Figure 1).

Engineers and managers on a nationwide and worldwide basis need to better acquire, organize, and manipulate environmental data for decision making purposes. A Geographic Information Systems (GIS) is a computerized system for processing geographic and/or mapped data. A GIS should be capable of processing a variety of pertinent data including points, maps, lines, textual, and aircraft or satellite derived information (Hill et al., 1983). GIS's have been developed and utilized in numerous industrial and government installations and many are summarized in Harlow (1980).

A primary capability of a GIS is to combine or overlay maps. Such uses may be to determine soil types in forested areas, that if cleared would have the least effect on flooding down stream. It is, therefore, an excellent tool to manipulate data to spatially generate site suitability maps. Probably, one of the most significant applications of a GIS is its use when merged as a data input device to environmental (engineering) simulation models. A GIS has the capability of converting information normally available to a modeler from mapped data into one dimensional (i.e., river characteristics) and two dimensional arrays (i.e., drainage basin characteristics) through digital data processing (Dantin et al., 1981).

Numerous models are not structured to accept study area characteristics directly. Characteristics such as slope, or soil type are typically averaged manually prior to input to the model as coefficients or sub-basin characteristics. The University of Maryland has conducted extensive research using GIS's to operate several hydrologic models (Ragan and Fellows, 1981). Of particular advantage of a GIS over a more traditional manual system is the ability to rapidly design alternations and view the results for analysis purposes.

Simulation of basin hydrology requires the use of spatially oriented data representing geomorphologic, climatologic, land-use, soil, and streamflow characteristics. Such data can not generally be used in the acquired format for they are not necessarily collected for the purpose of hydrologic modeling alone. A second problem is that existing data are rarely sufficient. For instance, geomorphologic data (including channel network characteristics) are usually acquired through manual interpretation of topographic maps. As mentioned earlier, the merging of data sets to acquire such hydrologic descriptors as SCS curve number are usually manually computed. The use of a GIS can greatly speed up this process of spatial data assimilation. The application of remotely sensed, mapped data, in combination with GIS technology to solve hydrologic data collection problems has been clearly demonstrated (Woodley et al., 1981; Hill et al., 1983; Ragan and Fellows, 1981; Eidenshink and Wehde, 1982).

The Remote Sensing and Image Processing Laboratory (RSIP), Louisiana State University had already constructed a digital data base of a portion of the Amite River Basin (Hill, et al., 1987). This data base was designed to demonstrate how a Geographic Information System (GIS) could be constructed to assist in data assimilation associated with the management of a floodplain. The data base was created in support of data requirements by a hydrologic model designed to predict the runoff hydrograph from ungaged basins. The GIS was used to digitally and spatially generate an integrated Soil Conservation Service (SCS) curve number for the portion of the basin understudy. To this end, soil associations and land-use (generated from analysis of Landsat satellite data) were merged in the GIS to acquire a map representing SCS runoff curve numbers. The volume of runoff obtained form the Watershed Hydrology Simulation (WAHS) Model (Singh, 1983) using this map was compared to the volume computed by hydrograph separation and found to be accurate within 19 percent. To demonstrate the effect of changing land-use on basin hydrology, the GIS was used to vary percentages from the drainage area from forest to bare soil. By changing basin runoff curve numbers, significant changes in

peak discharge were noted. The spatial map created by the GIS could be used by engineers and/or managers to easily, spatially change land-use at various locations across a basin and determine specific resulting impacts. The GIS capability eliminated many of the more traditional manual phase of data input and manipulation, thereby allowing researchers to concentrate on the development and calibration of the model and interpretation of presumably more accurate results.

With previous experience concerning available data sets representing the Amite River Basin and a GIS capability, RSIP proceeded to generate the data base and results described in the report. The remainder of this report describes the construction of the GIS and generation of results.

2. MATERIALS AND METHODS

This section describes the various data sources, methods of photointerpretation, digitization, data base creation, and generation of results from GIS analysis procedures.

2.1. Data Sources

The original data sources for this project consist of maps and aerial photographs detailing drainage basins, parish boundaries, soil associations, and land use/land cover types for three separate years. Each specific data set is described in the following sections.

2.1.1. Drainage Basins

The COE provided 1:62,500 U.S. Geological Survey (USGS) maps (paper format) on which they outlined 60 sub-basins within the study area.

2.1.2. Parish Boundaries

Parish boundaries were derived from the above mentioned 1:62,500 USGS maps.

2.1.3. Soil Associations

A digital map of soil associations was acquired from the Computer Aided Design/Geographic Information Systems (CAD/GIS) Laboratory at LSU. This map had been generated by the Soil Conservation Service (SCS), U.S. Department of Agriculture (USDA). These are fairly generalized maps with an original minimum mapping resolution of 640 acres. While generalized, detailed parish soil maps are still in preparation by the SCS and the data used were the only available contiguous soils data of the study area. Table 1 represents the SCS soil associations which were mapped within the study area.

2.1.4. Land Use/Land Cover

Time, funding, and available data were important factors in the selection of land cover data sets. The earliest source of land cover data used was a 1954 (updated in 1961) USGS map at a scale of 1:250,000. It was formally entitled the "Baton Rouge" map. This map distinguishes the following categories of land cover, water forest, forested wetland, non-forested wetland, cleared land, and urban built-up land. This map was updated in 1961, meaning that urban areas were updated, but that surrounding areas were probably not and, therefore, represent 1954 conditions. A mylar map could not be acquired in a timely manner from the USGS, so a paper map was used to abstract (copy) this particular data set.

The USGS mapped 1978 land cover conditions using high altitude color infrared aerial photography (scale; 1:65,000; acquired in October 1978 by the U.S. Environmental Protection Agency (EPA)). USGS Level 2 land cover categories (Anderson et al., 1976) were mapped for 1978 (Table 2).

The minimum mapping unit for the 1978 land cover was originally 10 acres for urban categories and 40 acres for all remaining natural categories. These data were mapped at an original scale of

Table 1. SCS soil associations which were mapped in the Amite River Basin study area.	
4-	Acy-Essen-Jeanerette
10-	Barbary-Fausse
30-	Calhoun
31-	Calhoun-Cascilla
34-	Calhoun-Olivier
36-	Cascilla-Ochlockonee
38-	Commerce
46-	Convent
55-	Deerford-Verdun-Frost
355-	Deerford-Verdun-Jeanerette
56-	Dexter-Calhoun
361-	Dundee-Baldwin
74-	Galvez-Commerce
95-	Hydraquents-Haplaquepts
130-	Memphis-Loring
132-	Mhoon-Commerce
147-	Olivier-Loring-Calhoun
448-	Olivier-Providence
160-	Providence-Lexington
177-	Sharkey
184-	Sharkey-Fausse
186-	Sharkey-Mhoon-Crevasse
189-	Sharkey-Tunica
208-	Water

1:250,000 (Baton Rouge quadrangle). This same strategy was selected to map the 1985 land cover so that a meaningful comparison could be derived for change between the two dates. RSIP also had a copy of the 1978 imagery and used it when there were occasional questions about the USGS's interpretation.

The source for 1985 land cover was high-altitude, color infrared photography acquired 14-15 December, 1985 by the National Aeronautics and Space Administration (NASA) as part of its Airborne Instrumentation Research Project. This imagery was at a scale of 1:62,000 and was, therefore, similar in many ways to that used by the USGS for the 1978 land cover data set. High quality roll-to-roll duplicate transparencies of the study area imagery were made by Precision Photo Laboratories of Dayton, Ohio. Every frame was duplicated to ensure that only the least distorted/best exposed center areas of each photograph would be interpreted for mapping purposes. The rolls were cut into individual frames for ease of handling.

2.2. Photointerpretation

Photointerpretation is both the art and science of deriving data from aerial imagery. The primary goal of this project was to update the 1978 USGS land cover map for the southern portion of the Amite River Basin. It was first necessary to devise a system of reference for accurately registering the photographs to the maps. The mylar 1978 USGS (1:250,000) land cover map was photographically enlarged (vacuum framed) to a scale of 1:62,500 so as to closely match the approximate scale of the photography. The USGS map only represented land cover polygons and, therefore, was lacking in photo-to-map registration features (i.e., roads, rivers). It was decided to also photographically (vacuum frame) copy the 1:62,500 USGS maps with numerous registration points onto a mylar (translucent) base. The enlarged 1978 land cover map was cut so that each piece corresponded with the associated 1:62,500

Table 2. Abbreviated land use and cover classification systems for USGS Levels I and II (Anderson et al., 1976)

Level I	Level II
1. Urban or built-up land	11. Residential
	12. Commercial and services
	13. Industrial
	14. Transportation, communications, and utilities
	15. Industrial and commercial complexes
	16. Mixed urban or built-up land
	17. Other urban or built-up land
2. Agricultural land	21. Cropland and pasture
	22. Orchards, groves, vineyards, nurseries, and ornamental horticultural areas
	23. Confined feeding operations
	24. Other agricultural land
3. Rangeland	31. Herbaceous rangeland
	32. Shrub and brush rangeland
	33. Mixed rangeland
4. Forest land	41. Deciduous forest land
	42. Evergreen forest land
	43. Mixed forest land
5. Water	51. Streams and canals
	52. Lakes
	53. Reservoirs
	54. Bays and estuaries
6. Wetland	61. Forested wetland
	62. Nonforested wetland
7. Barren land	71. Dry salt flats
	72. Beaches
	73. Sandy areas other than beaches
	74. Bare exposed rock
	75. Strip mines, quarries, and gravel pits
	76. Transitional areas
	77. Mixed barren land

quadrangle. This combination of cultural and hydrologic feature line-work and land cover polygons assured the best registration of photographs to maps. A Kargl reflecting projector, which makes scale changes between different photographic frames and allows for geometric adjustments for anterior and lateral tilt of the imagery, was used for photo-to-map transfer.

Each 15 minute (1:62,500) quadrangle was updated as a unit by a specific photointerpreter for efficiency and product control purposes. The photographs were sequentially mounted and registered, and only updated (change) land cover polygons were traced on a separate herculene sheet overlaying the 1978 land cover and topographic maps. Once registered, the topographic map was often removed to obtain a clearer image. After one of the two photointerpreters had finished updating a quadrangle, it was edited by the other interpreter with mutual discussions regarding changes where necessary. Areas where land cover could not be determined were temporarily labeled "unknown". Land cover for these relatively few areas was determined during a low altitude overflight of the area(s). This flight occurred on 15 June 1987. Upon verification, questionable polygons were updated where necessary.

Any photointerpretation project concerning the mapping of manmade and particularly natural features encounters difficulties in classification and accuracy. This section describes the opportunities for compromise and the reasons for making such decisions throughout this project. All decisions were made jointly with the COE.

1) **Forest Types.** RSIP interpreters found that the mapping of forest units by the USGS seemed less accurate than the mapping of urban or agricultural units. Although the standard mapping unit for forests is 40 acres, large tracts of forest containing small individual stands of deciduous, evergreen, and mixed association tended to be mapped as one large unit. This project was primarily concerned with updating the 1978 map, and not with a critique or revision of USGS photointerpretation and land use classification practices. However, in the interests of evaluating the reliability of their forest classification in the Amite River Basin, an accuracy test for USGS mapping of forest types was devised.

During aerial ground truthing, a series of forest areas were examined by the interpreters with the goal of verifying the correspondence between photographic tones and textures and actual forest types. This review enabled the interpreters to be reasonably certain of the accuracy of their classification of the infrared photographs. The December 1985 imagery was excellent data for the verification of the 1978 (October, leaves on) imagery (map) used by the USGS. Being December, leaves were basically off the deciduous trees and the 3 major forest categories (pine, deciduous, mixed) were relatively easily discriminated. A group of 250 points was randomly generated on a map of the Amite River Basin, a number large enough to ensure that at least 100 forest polygons would be intersected. The forest type for each of the 122 points that happened to fall in a forest was determined from examination of the 1985 photographs by the two interpreters. A confusion matrix comparing the findings of the photointerpreters and the USGS is provided in Table 3.

Table 3. Confusion matrix comparing RSIP versus USGS forest interpretations.

VERIFIED		41	42	43	61
L					
A	41	27	0	3	0
B	42	0	11	7	1
E	43	5	2	20	0
L	61	0	0	4	36

The overall level of accuracy obtained in this sample is 81%, with an upper confidence limit of 88% and a lower confidence limit of 74% at a 95% level of confidence. The USGS standards for accuracy prescribe 85% overall agreement, but not necessarily within individual categories. This sample indicates that their mapping of forest units was probably slightly less accurate than is usual. Most of the discrepancy can be attributed to over-generalization on the part of USGS who apparently chose to delineate larger mapping units than required given the 40 acre mapping limit.

2) **Clearcuts.** The conventional USGS classification of clearcuts in forested land is to consider them forest. While this category accurately fits their former (and probably future) land cover it does not reflect their current status in terms of wildlife habitat and run-off characteristics. Because this study seeks to identify change between 1978 and 1985, it would be misleading to classify 1985 clearcuts into a category separate from forest. Hence, the updated 1985 map merges clearcuts into the forest category. However, a separate map and a table of acreages could later be produced to provide information on the extent and location of forest clearcuts. This was done upon request of the COE and the U.S. Fish and Wildlife Service (USFWS).

2.3. GIS Development

Numerous tasks are performed in the production of a GIS. These include the 1) digitization of photointerpreted maps, 2) plotting and editing of these products, 3) conversion of these line (vector) based maps into pixel (raster) format, 4) map overlay and data processing using the GIS, and 5) final product generation (i.e., text, maps, slides). All data processing was performed at the Remote Sensing and Image Processing Laboratory (RSIP), Louisiana State University (LSU). The NASA developed ELAS software was used to perform most of the data processing for this project. ELAS is an interactive image analysis and GIS system which has been implemented and further modified by RSIP. These various tasks are described briefly in the next subsections of this report.

2.3.1. Map Digitizing

Six digital map sets were produced during the course of this project, and these include parish boundaries, basin boundaries, soil associations, and 1954, 1978, and 1985 land use. All data but the 1978 land use data were digitized on an Intergraph computer mapping system. The 1978 land use data were derived from USGS GIRAS format digital data (Fegeas et al., 1983). These data were digitized by the USGS from 1:250,000 mylar land use maps and converted to Intergraph format.

Map digitizing on the Intergraph system was done using the following procedure. Materials to be digitized were first mathematically tied to the data file by selecting points on the maps for which coordinates are known. This setup procedure minimized distortions in the source map caused by shrinkage or stretching of the map material. These points were typically, but not necessarily, located at map cornerpoints. The accuracy of map registration was inspected after setup to insure that control points were properly located.

Next, X and Y coordinates for the linework were entered into the system by an operator who traced map features using a cursor connected to an X-Y digitizing table. The resulting linework was then edited by a computer program for overlapping lines or gaps and converted to unique polygons and appropriately labeled. Plots were then produced and overlain on the original map and checked for incorrect labeling or digitization. After the digitized maps had been verified, they were converted from the Intergraph vector-based format to the ELAS (Earth Resources Laboratory Applications Software; NASA, 1980) raster format of analysis. GIS and Data Processing

Once the maps are digitized, they need to be input and overlain in a GIS. Once in the GIS, they can be merged and/or analyzed. The polygon data digitized using the Intergraph system were converted to raster data files using the ELAS module PUDR. PUDR is a vector to raster conversion program that generates a gridded data set with a specified cell size. The cell size chosen for this study was 50 m. Two standard ELAS modules, PLYA and TLYX were used for measuring areas and mapping change. In addition, RSIP programmers modified TLYX to produce two additional programs, TLYM and TLMM. PLYA was used to measure basin-wide areas of different classes such as soil types, land cover, and basins. TLYX, TLYM and TLMM tabulate co-occurrences of data values in 2, 3, and 4 data channels, respectively. These modules were used for calculations such as land cover change by subbasin and by soil association.

The method by which the GIS is used to manipulate maps is graphically represented in Figure 2. Table 4 represents the basin parameters which were used to generate acreage estimates found in the Appendix.

2.3.2. Final Product Generation

Output products were in three forms, tables of areas, 35 mm slides and pen-plotter output. Tabular output was generated by the ELAS modules described above and reformatted to improve readability. Color slides of ELAS data files were generated using a MATRIX camera attached to RSIP International Imaging Systems display. Pen plots at a scale of 1:62,500 were produced using the Intergraph plotting software and a Hewlett-Packard pen plotter. Rough copies were first plotted on paper for cartographic editing, final plots were produced using high quality drafting film and permanent ink. Map labels

Table 4. Basin parameters used for generating acreages.	
1)	Basin area
2)	Sub-basin areas
3)	Parish areas
4)	Soil association areas
5)	Basin land cover, 1954
6)	Basin land cover, 1978
7)	Basin land cover, 1985
8)	Land cover change, 1954-1978
9)	Land cover change, 1978-1985
10)	Soils by parishes
11)	Land cover by parish, 1954
12)	Land cover by parish, 1978
13)	Land cover by parish, 1985
14)	Land cover change by parish, 1954-1978
15)	Land cover change by parish, 1978-1985
16)	Land cover by sub-basin, 1954
17)	Land cover by sub-basin, 1978
18)	Land cover by sub-basin, 1985
19)	Land cover change by sub-basin, 1954-1978
20)	Land cover change by sub-basin, 1978-1985
21)	Land cover by soil by sub-basin, 1954
22)	Land cover by soil by sub-basin, 1978
23)	Land cover by soil by sub-basin, 1985

generally followed standards set by the USGS.

Portions of 11, 1:62,500 maps were generated for each map type (i.e., land-cover, soils) of the study area (Table 5). Where extremely small portions of maps were interpreted, they were added to the plot of the neighboring full map quadrangle (9 total 1:62,500 maps). Parish boundaries were not plotted separately because they are present on the standard 1:62,500 USGS quadrangles (1:62,500) to be used as base maps on which to overlay the maps generated by this project.

Table 5. Base maps for which overlays were generated.	
1)	Felixville
2)	Zachary
3)	Pine Grove
4)	Baton Rouge
5)	Denham Springs
6)	Springfield
7)	White Castle
8)	Donaldsonville
9)	Mount Airy

Five large scale plots were generated of each map type for use as an index of the 1:62,500 maps. Table 6 represents the maps that were plotted and presented to the COE as final products of this project. For presentation purposes, color slides were generated to depict the data processed as part of this project.

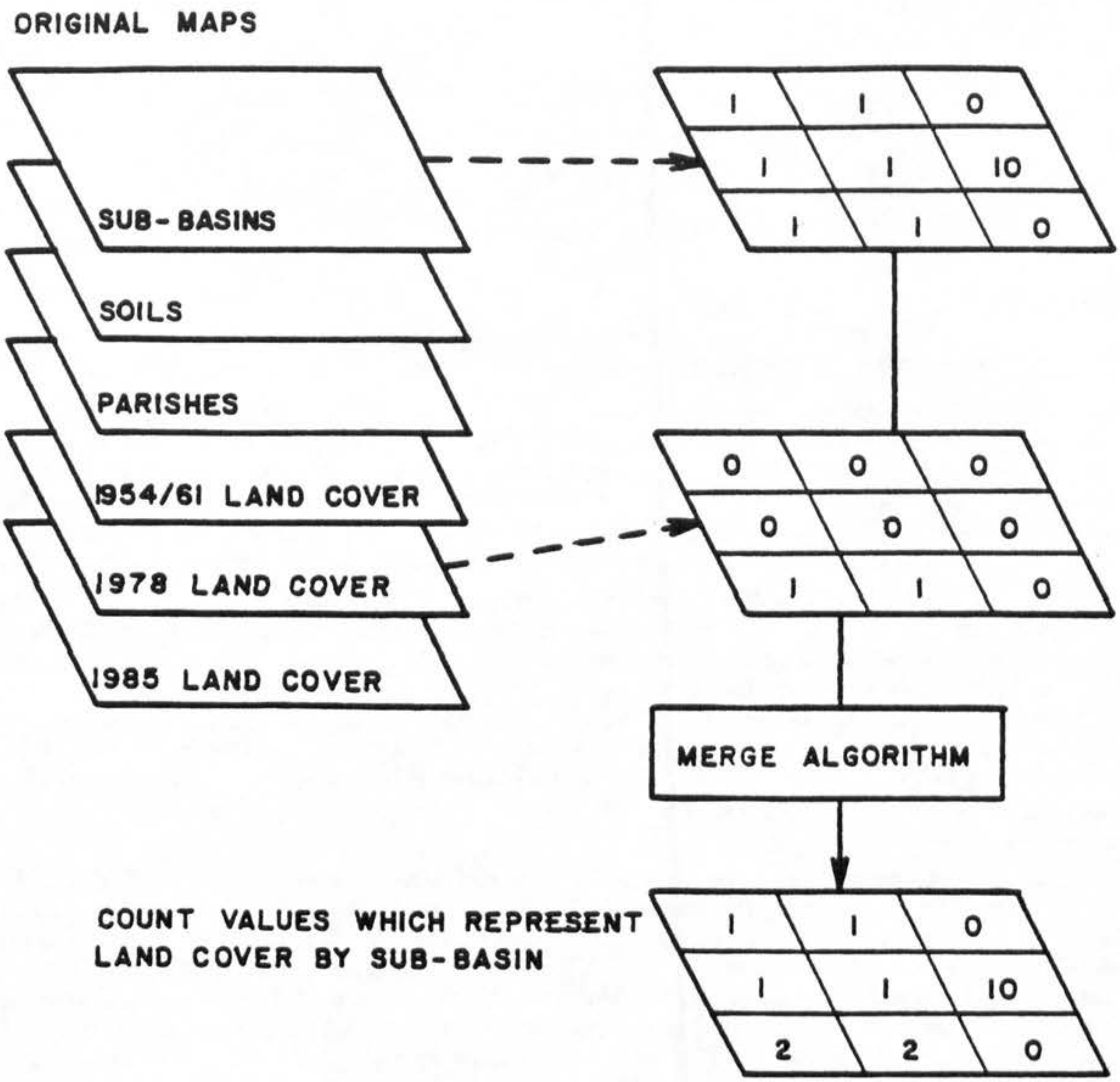

Fig. 2. Flow chart describing the use of a GIS to merge mapped data.

Table 6. Final maps generated as results of this project for the Amite River Basin study area.

Map Type		Scale(No.)	1:62,500
1	Sub-Basins	1	9
2	Soil Associations	1	9
3	1954/61 Land Cover	1	9
4	1978 Land Cover	1	9
5	1985 Land Cover	1	9
	Total Maps	5	45

3. RESULTS AND RECOMMENDATIONS

The results of this project take the form of tables, maps, and slides. The tables representing various acreage figures by basin parameter are found in the Appendix. They are found in the order as outlined in the GIS Development and Data Processing Section (2.3.2) of this report. Aside from the 1985 land cover update map of the 1978 USGS information (map), only existing data (maps) were used for all phases of this project. Numerous data sources at varying scales and categories were merged to generate the final products. Therefore, it is appropriate to present a brief discussion of selected data sets.

The 1978 USGS mapped data did not exactly overlay onto the 1:62,500 USGS maps as well as anticipated. This is not an error, the map was generated from a digital tape produced by the USGS and was simply within the mapping accuracy of their land-cover maps at a original scale of 1:250,000. The 1978 to 1985 land-cover change data is deemed to be accurate within the mapping resolutions used in this project. The original 1954/61 USGS map only represented four very generalized land cover categories, at a gross mapping resolution, and two dates (1954 and 1961). A comparison test was run between these two sets, and the 1954 to 1978 analysis resulted in some unique land cover changes (i.e., urban to forest or wetlands). The 1954 to 1978 land-use change data should be used with these considerations in mind.

Several recommendations are proposed if further data analysis is required by the COE for the Amite River Basin study area. The detailed SCS soil series maps should be entered into the GIS as they are made available. A few are presently complete. The COE has generated numerous other detailed data sets of the Amite study area (i.e., 2 foot contours, building locations). These data should also be added to the GIS. There is also an Environmental Impact Statement (EIS) being conducted for the proposed Darlington Reservoir. Numerous maps (i.e., wildlife habitats, archeological sites) are likely to be generated through this EIS. These too should be input to the GIS. It is recommended that these future maps be standardized where they could be relatively easily input to a GIS.

The COE and associated Louisiana state agencies will be involved with various aspects of the Amite River Basins for years to come. The proposed GIS could then be used to accurately and cost effectively generate numerous scenarios (i.e., land use change, flood damage assessment by contour). The GIS could be further used by the COE and agencies to develop, test and/or calibrate numerous other water simulation models (i.e., SLOSH, floods) that could and should be introduced as planning tools within the COE district and state.

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APPENDIX A

TABLES OF ACREAGES

APPENDIX B

Sub-Basin Names in the Southern Amite River Basin

Sub-Basin Number	Basin Name
1	Bayou Baton Rouge
2	Upper Cypress Bayou
3	Upper White Bayou
4	Redwood Creek
5	Comite River Above Redwood Creek
6	Lily Bayou
7	South Canal & Cypress Bayou
8	Comite River Vicinity of Dyer Rd.
9	Baker and South Canal
10	Cypress Bayou
11	Cypress Bayou Extension
12	White Bayou
13	Blackwater Bayou
14	Beaver Bayou
15	Monte Sano Bayou
16	Hurricane Creek
17	Comite River Vic. of Jones Bayou
18	Comite River Near Shoe Creek
19	Comite River Near Draughan Creek
20	Capital Lake
21	Upper Ward Creek
22	Jones Creek
23	Lively Bayou Tributary
24	Lively Bayou
25	Bayou Duplantier
26	Upper Dawson Creek
27	North Branch of Ward Creek
28	Weiner Creek
29	Bayou Fountain
30	Lower Dawson Creek
31	Claycut Bayou

APPENDIX B (Continued)

Sub-Basin Names in the Southern Amite River Basin

Sub-Basin Number	Basin Name
32	Lower Ward Creek
33	Bayou Braud and Spanish Lake
34	Upper New River
35	Grand Goudine
36	New River Vic. of Gonzales
37	Bayou Francois
38	Bayou Conway
39	Bayou Narcisse
40	Lower Black Bayou
41	Black Bayou Vic. of Duplessis
42	Amite River at Diversion Canal
43	Muddy Creek
44	Amite River at Port Vincent
45	Colyell Bay and Creek
46	Lower Grays Creek
47	Amite River Below Denham Springs
48	Honey Cut Bayou
49	Millers Canal
50	Upper Grays Creek
51	Upper Amite River
52	Beaver Creek
53	Upper Beaver Creek
54	Amite River at Denham Springs
55	Amite River at Greenwell Springs
56	Amite River Vic. of Baywood
57	Pigeon Creek
58	Amite River at Bluff Creek
59	Lower Amite River
60	Bayou Manchac

FINAL REPORT

Land-Use and Floodplain Trend Analysis of the Southern Amite River Basin: 1972-1985 (RSIP T.R. 3.01.88)

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Submitted to

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New Orleans District
New Orleans, Louisiana

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The authors express appreciation to Mr. Kevin Marshal (RSIP) for assistance in the various computer programming tasks required by this project. Ms. Carol Wilson and Mr. Daniel Flint were responsible for digitizing the floodplain maps and generation of all computer plots. Ms. Belinda Chaney was responsible for all of the word processing in this report. Appreciation is also given to the contract technical officer, Mr. Falcolm Hull (COE) throughout the course of this project.

This project was conducted through funding provided by the New Orleans District of the U.S. Army Corps of Engineers under contract number DACW29-88-M-0827.

TABLE OF CONTENTS **PAGE**

Land-Use and Floodplain Analysis of the Southern Amite River Basin: 1972-1985

1.0 INTRODUCTION

The U.S. Army Corps of Engineers (COE) is conducting a study to investigate the feasibility of providing flood protection for the residents in Amite River Basin. This project was conducted with the primary objective of providing acreage estimates of historic land-use trends within the limits of various floodplain boundaries for the southern portion of the Amite River Basin, Louisiana. Data from this report are to be used to help asses the impacts of alternative plans on future land-use in the basin. The COE, under a previous contract (Hill, et al 1987), had the Remote Sensing and Image Processing Laboratory (RSIP) Louisiana State University (LSU) build a computerized Geographic Information System (GIS) consisting of 1954, 1978, and 1985 land-use data, soil associations, sub-drainage basins, and parish boundaries. For this contract a 1972, U.S. Geological Survey (USGS) digital data set was added to the GIS. COE generated 100 year, 25 and 10 year floodplains were also added to the data base.

Acreage estimates of various combinations of data (i.e., land-use inside and outside each floodplain by year mapped) were generated. These data were sent to the COE for various planning activities. A reformatted data set was also sent to the Louisiana Office of State Planning for use in helping the COE estimate potential urban growth trends by sub-basin.

2.0 MATERIALS AND METHODS

The sources of 1954, 1972, 1985 land-use, soil associations, sub-drainage basins, and parish boundaries is found in Hill, et al 1987. This section will describe only the new sources of data entered into the existing GIS under this project and include map digitization and generation of results.

2.1 Data Sources

The original data sets for this particular project consisted of 1972 land-use / land cover and floodplain maps. Each specific data set is described in the following sections.

2.1.1 1972 Land Use / Land Cover

The Louisiana Office of State Planning had a USGS mapped 1972 land cover data set on a digital tape. The exact format and condition of the data was unknown. RSIP transferred, reformatted, visually reviewed, and found the data to be useful. The individual polygons were not labeled and had to be manually input to the digital map using a 1972 reference mylar map (scale; 1:250,000) also provided by the Office of State Planning.

There were two primarily differences between this 1972 USGS generated map from the earlier processed 1978 and 1985 data sets. First, the 1972 polygon borders consisted of straight lines and squared off corners. The later maps (1972 and 1985) consisted of more rounded polygons. While exact polygon boundaries did not overlay exactly, the relative acreage estimates and associated changes are useful information. The 1972 data was originally photointerpreted using leaf-off imagery. It was mapped at a scale of 1:250,000 (Baton Rouge quadrangle). Generally, the urban areas were mapped at a spatial resolution (minimum mapping unit) of 10 acres and all other land-cover categories were mapped at 40 acres or greater.

Second, the USGS used a bit different land-use / land cover classification scheme for the 1972 data set. The Louisiana Office of State Planning (Personnel communications with Mr. Glen Daigre)

developed a scheme to standardize the 1972 to the existing 1978 and 1985 categories. The plan as approved by the COE is as follows:

1. The '72 category 14 is "Extractive". For the Baton Rouge area most of this is gravel pits. Therefore, the category 14 should be renumbered as 75. Some data distortion is to be expected because oil fields came under this category in "72. However, within the study area for this project this distortion should be minimal.
2. The '72 category 75 is "Other". This should convey to the "78 category 76, "Transitional".
3. The '72 category 15 should be renumbered as 14. Some distortion will also be noted here as the criteria for mapping these areas were changed between '72 and '78.
4. There was no equivalent for the '78 category category 15, "Industrial and Commercial Complexes" in the '72 data.
5. The '72 category 16, "Institutional" should be grouped with the category 12 because the '78 definition of "Commercial and Services" includes institutional uses.
6. Both '72 categories 17, "Strip and Clustered Settlement" and 18, "Mixed" should be grouped and renumbered as category 16.
7. The '72 category 19 is the equivalent of the '78 category 17.

Table 1 represents the USGS Level 2 land-use / land cover categories used in this report.

Table 1. Land-use / land cover categories used for all dates studied in this project.

CATEGORY NO.	DESCRIPTION
11	**Residential**
12	**Commercial and services**
13	**Industrial**
14	**Transportation, communications, and utilities**
15	**Industrial and commercial complexes**
16	**Mixed urban or built-up land**
17	**Other urban or built-up land**
20	**Agricultural land**
21	**Cropland and pasture**
22	**Orchards, groves, vineyards, nurseries, and ornamental horticultural areas**
23	**Confined feeding operations**
24	**Other agricultural land**
41	**Deciduous forest land**
42	**Evergreen forest land**
43	**Mixed forest land**
50	**Water**
51	**Streams and canals**
52	**Lakes**
53	**Reservoirs**
61	**Forested wetland**
62	**Nonforested wetland**
75	**Strip mines, quarries, and gravel pits**
76	**Transitional areas**

For the purpose of generating future land-use projections for the COE, the Office of State Planning requested the grouping of all water categories and all agricultural lands into just two categories. Two separate acreage reports were therefore generated, one for the COE and one for the Office of State Planning.

2.1.2 Floodplain Data

The COE provided 100, 25, and 10 Year Floodplain boundaries drawn on 22 standard USGS 1:24,000 quadrangles (Table 2). These three floodplains primarily differed on the resulting Baton Rouge and Zachary 1:62,500 quadrangles. When any or all of the floodplains were within approximately one eighth of an inch (200 ft.), on the original COE provided maps, they were merged into one line. The final line was located between the originally mapped lines. This was agreed on by the COE and implemented due to the complexity of boundaries and project constraints.

This project study area, encompassing floodplains, was slightly different from the original data base boundary (Figure 1). This slightly smaller study area was taken into consideration and used to generate the floodplain data associated with this report.

2.3 GIS Development

All data processing was performed at the Remote Sensing and Image Processing Laboratory (RSIP), Louisiana State University (LSU). The National Aeronautics and Space Administration (NASA) developed ELAS software was used to perform all GIS data processing functions of this project. ELAS is an interactive image analysis and GIS system which has been implemented and further modified by RSIP. The tasks utilizing the GIS are described briefly in the next subsections of this report.

2.3.1 Map Digitizing

The process of map digitizing is described in Hill, et al. (1987). The original 22, 1:24,000 floodplain maps (Table 2) were merged into portions of 11, 1:62,500 quadrangle overlays. The polygons representing the 1972 land use / land cover data were also input to the digital GIS using the Intergraph computer mapping system. Digitized and labeled polygons were compared (edited) by a separate interpretor to the original COE provided base maps. Questionable polygons were verified and/or updated where necessary. Through use of the ELAS software (Hill, et al. 1987), this data was gridded into 50m cells and overlain (registered to) on the existing Geographic Information System (GIS).

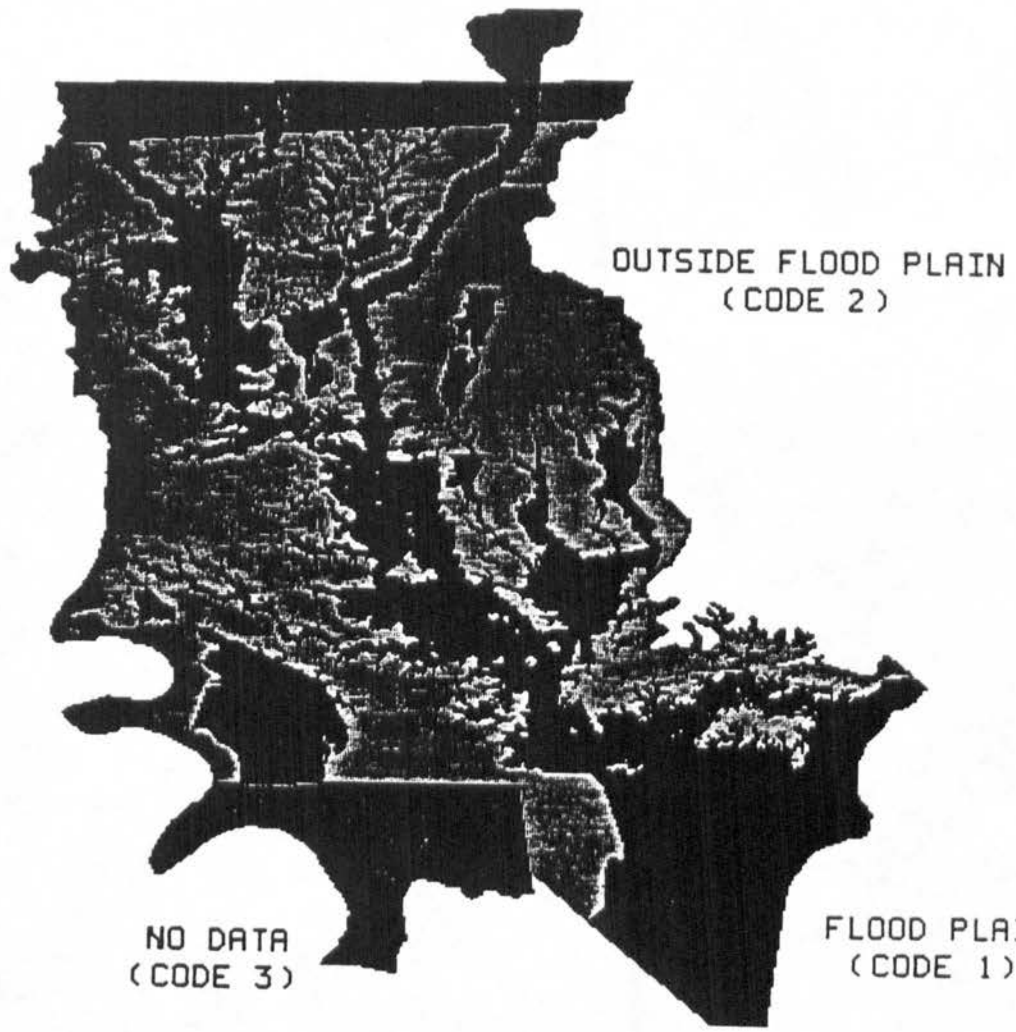
OUTSIDE FLOOD PLAIN
(CODE 2)
NO DATA
(CODE 3)
FLOOD PLAIN
(CODE 1)

Fig. 1. Graphic representation depicting the different boundaries between the original GIS and the COE provided floodplain study area.

Table 2. Topographic maps (1:24,000) used in mapping the 100, 25, and 10 Year Floodplains.

1	**Baton Rouge East, La.**
2	**Baton Rouge West, La.**
3	**Comite, La.**
4	**Denham Springs, La.**
5	**Fred, La.**
6	**French Settlement, La.**
7	**Frost, La.**
8	**Killian, La.**
9	**Mount Airy NE, La.**
10	**Mount Airy NW, La.**
11	**Pine Grove, La.**
12	**Plaquemine, La.**
13	**Prairieville, La.**
14	**Pride, La.**
15	**Satsuma, La.**
16	**Scotlandville, La.**
17	**Sorrento, La.**
18	**St. Gabriel, La.**
19	**Walker, La.**
20	**Watson, La.**
21	**Whitehall, La.**
22	**Zachary, La.**

2.3.2 Final Product Generation

Output products were in four formats: tables of areas (acreage), 35mm color slides, laser printer (8.5 by 11 inch) plots, and computer plotter generated pen plots (1:24,000 quadrangle sized overlays). Tabular output was generated by ELAS modules described in Hill, et al (1987). Tables 3 and 4 represent the basin parameters used for calculations such as land use / land cover change by subbasin by year. These acreage results for the two reports (COE and Office of State Planning) are outlined in Tables 3 and 4, respectively. Color slides of ELAS data files were generated using a MATRIX camera attached to an International Imaging System display. Pen plots at a scale of 1:62,500 were produced using the Intergraph plotting software and produced using high quality drafting film and permanent ink. Map labels generally followed standards set by the USGS.

Table 3. Land use / land cover scenarios calculated for the COE of various parameters for the dates studied in the Amite River Basin, Louisiana.

1972 Land Use

1972 Land Use by 100 Year Flood Plain

1972 Land Use by 100 Year Flood Plain and by Sub-Basin

1972 Land Use by 100 Year Flood Plain and by Parish

1972 Land Use by 25 Year Channel Modification

1972 Land Use by 25 Year Channel Modification and by Sub-Basin

1972 Land Use by 25 Year Channel Modification and by Parish

1972 Land Use by 10 Year Comite Diversion

1972 Land Use by 10 Year Comite Diversion and by Sub-Basin

1972 Land Use by 10 Year Comite Diversion and by Parish

1978 Land Use

1978 Land Use by 100 Year Flood Plain

1978 Land Use by 100 Year Flood Plain and by Sub-Basin

1978 Land Use by 100 Year Flood Plain and by Parish

1978 Land Use by 25 Year Channel Modification

1978 Land Use by 25 Year Channel Modification and by Sub-Basin

1978 Land Use by 25 Year Channel Modification and by Parish

1978 Land Use by 10 Year Comite Diversion

1978 Land Use by 10 Year Comite Diversion and by Sub-Basin

1978 Land Use by 10 Year Comite Diversion and by Parish

1985 Land Use

1985 Land Use by 100 Year Flood Plain

1985 Land Use by 100 Year Flood Plain and by Sub-Basin

1985 Land Use by 100 Year Flood Plain and by Parish

1985 Land Use by 25 Year Channel Modification

1985 Land Use by 25 Year Channel Modification and by Sub-Basin

1985 Land Use by 25 Year Channel Modification and by Parish

1985 Land Use by 10 Year Comite Diversion

1985 Land Use by 10 Year Comite Diversion and by Sub-Basin

1978 Land Use by 10 Year Comite Diversion and by Parish

1972-1978 Land Change

1972-1978 Land Change by 100 Year Flood Plain

1972-1978 Land Change by 100 Year Flood Plain and by Sub-Basin

1972-1978 Land Change by 100 Year Flood Plain and by Parish

1972-1978 Land Change by 25 Year Channel Modification

1972-1978 Land Change by 25 Year Channel Modification and by Sub-Basin

1972-1978 Land Change by 25 Year Channel Modification and by Parish

1972-1978 Land Change by 10 Year Comite Diversion

1972-1978 Land Change by 10 Year Comite Diversion and by Sub-Basin

1978-1985 Land Change by 10 Year Comite Diversion and by Parish

1978-1985 Land Change

1978-1985 Land Change by 100 Year Flood Plain

1978-1985 Land Change by 100 Year Flood Plain and by Sub-Basin

1978-1985 Land Change by 100 Year Flood Plain and by Parish

1978-1985 Land Change by 25 Year Channel Modification

1978-1985 Land Change by 25 Year Channel Modification and by Sub-Basin

1978-1985 Land Change by 25 Year Channel Modification and by Parish

1978-1985 Land Change by 10 Year Comite Diversion

1978-1985 Land Change by 10 Year Comite Diversion and by Sub-Basin

1978-1985 Land Change by 10 Year Comite Diversion and by Parish

Table 4. Land use / land cover scenarios calculated for the Office of State Planning for the 1972-1985 period within the Amite River Basin, Louisiana.

1972 Land Use

1972 Land Use by Sub-Basin

1972 Land Use by Parish

1972-1985 Land Change

1972-1985 Land Change by Sub-Basin

1972-1985 Land Change by Parish

3.0 RESULTS AND RECOMMENDATIONS

The results of this project take the forms of tables, maps, report size laser plots, and slides. The tables representing various acreage figures by basin parameter are found in Appendices A and B. They are found in the order as outlined in the GIS and Data Processing Section (2.3.2) of this report (Tables 3 and 4). Appendix A was generated for the COE and a slightly reformatted version (Appendix B) was generated for the Louisiana Office of State Planning. The list of plotted land use / land cover and floodplain maps is represented in Table 5. The list of color 35mm slides is found in Table 6.

Numerous data sources of varying scales and categories were merged to generate the final products of this project. Therefore, it is appropriate to present a brief discussion of selected data sets. The majority of data sources are described in Hill, et al. (1987) which represents the initial data base. This evaluation, therefore, concentrates only on the USGS generated 1972 land use / land cover and COE provided floodplain data sets. The 1972 polygons were plotted and overlain on 1985 land use / land cover polygons for visual inspection. The 1972 polygons were formed by straight lines and, therefore, varied in shape from the curved polygon edges of the 1978 and 1985 boundaries. The exact locations varied slightly on all sides, but the corresponding polygons for these three dates could be discerned. There were also differences in specific class acreage estimates. The USGS interpretors of the 1972 data apparently chose a slightly different classification scheme. This was, however, modified to make it compatible with the latter data sets (1978 and 1985). The interpretors also apparently chose to map subcategories within a class differently on the 1972 data. As an example, they chose to put most of the forest acreage in the "Mixed Forest Land" category for 1972. For 1978 they chose to be more specific and, therefore, put more acreage into the USGS Level 2 (Anderson, et al. 1976) categories of "Deciduous Forest Land" and "Evergreen Forest Land." This process is typically called "grouping" versus "splitting" categories. The total or combined forested acreage is, however, compatible between all mapped data. These data sets should be used with these considerations in mind.

The floodplain data sets represented portions of a total of 11 (1:62,500) maps. Due to the complexity of visualizing multiple (3) floodplain boundaries, map separates were generated for the two quadrangles (Baton Rouge and Zachary) where the project designs most modified the 100 year floodplain boundaries. The labels (i.e., (1) inside and (2) outside the floodplain) may be a bit confusing initially due to the fact that floodplain boundaries change as project designs are outlined on the same map. These changes are discernible if the reader notices that the 100 year floodplain (solid lines) is reduced to 25 year (dashed lines) and 10 year floodplain (dotted lines) boundaries where planned projects have an effect. The majority of floodplain boundaries are represented by the same line, particularly in the southern and northern reaches of the study area. This is because the 100 year floodplain does not change as the 25 and 10 year modifications are put into effect.

Several recommendations are proposed if further data analysis is required by the COE for the Amite River Basin study area. The detailed SCS soil series maps should be entered into the GIS as they are made available. A few are presently complete. The COE has generated numerous other detailed data sets of the Amite study area (i.e., 2 foot contours, building locations and associated attributes). These data should also be added to the GIS. There is also an Environmental Impact Statement (EIS) being conducted for the proposed Darlington Reservoir. Numerous maps (i.e., wildlife habitats, archeological sites) are likely to be generated through this EIS. These too should be input to the GIS. It is recommended that these future maps be standardized where they could be relatively easily input to this GIS.

The COE and associated Louisiana state agencies will be involved with various aspects of the Amite River Basin for years to come. The proposed GIS could then be used to accurately and cost effectively generate numerous scenarios (i.e., land use change, flood damage assessment by contour). The GIS could be further used by the COE and agencies to develop, test and/or calibrate numerous other water simulation models (i.e., SLOSH, floods) that could and should be introduced as planning tools within the COE district and state.

Table 5. Final list of 1:62,500 maps (total 20) generated as results of this project for the Amite River Basin study area.

Map Type	USGS Map Name
1972 Land-Use / Cover	**Baton Rouge**
	Denham Springs
	Donaldsonville
	Felixville
	Mount Airy
	Pine Grove
	Springfield
	White Castle
	Zachary
Floodplains	
50,25,10	**Baton Rouge**
50	**Denham Springs**
25	**Denham Springs**
10	**Denham Springs**
50,25,10	**Donaldsonville**
50,25,10	**Mount Airy**
50,25,10	**Pine Grove**
50,25,10	**Springfield**
50	**Zachary**
25	**Zachary**
10	**Zachary**

Table 6. Listing of 35mm color slides depicting various land-use scenarios of parameters within the Amite River Basin.

1 - 1972 Land Use
2 - 1972 Land Use and Sub-Basins
3 - 1972 Land Use and Parish Boundaries
4 - 100 Year Floodplain
5 - 25 Year Floodplain
6 - 10 Year Floodplain
7 - 1972 Land Use and 100 Year Floodplain
8 - 1972 Land Use and 25 Year Floodplain
9 - 1972 Land Use and 10 Year Floodplain
10 - 1978 Land Use and 100 Year Floodplain
11 - 1978 Land Use and 25 Year Floodplain
12 - 1978 Land Use and 10 Year Floodplain
13 - 1985 Land Use and 100 Year Floodplain
14 - 1985 Land Use and 25 Year Floodplain
15 - 1985 Land Use and 10 Year Floodplain

4.0 LITERATURE CITED

Anderson, J.R., E.E. Hardy, J.T. Roach, and R.E. Witmer. 1976. A Land-use and Land-cover Classification for Use with Remote Sensor Data, Professional Paper 964, U.S. Geological Survey, Reston, Virginia.

Hill, J.M., S.E. Dicks, R.N. Terry, and D.L. Worthy. 1987. Historical Land-Cover Change Mapping for Floodplain Management within the Amite River Basin, Louisiana. Final Report, RSIP T.R. 3.01.87. Remote Sensing and Image Processing Laboratory, Louisiana State University, Baton Rouge.

PROJECTION OF LAND USES IN
THE AMITE RIVER BASIN STUDY AREA
1990 - 2040

Report prepared for
The U.S. Army, Corps of Engineers

by
The Louisiana State Planning Office

Research and Analysis
by
Glen Daigre

May, 1988

PROJECTION OF LAND USES IN THE AMITE RIVER BASIN STUDY AREA
1990 - 2040

Introduction

The projection of future land uses is a process based upon three principles: knowledge of planned activities in an area, awareness of constraints upon development, and the extension of historical trends. All of these factors become less reliable predictors as the time from the present increases. Projection reliability also decreases proportionately with the size of the area for which the projection is being made due to the greater impact of unpredic-table, individual decisions. Thus, while short term projections for the entire study area may be considered relatively dependable, long term projections for a single subbasin are much less reliable. Users of land use projections should consider these limitations in the application of this type of data.

Methodology

The primary factor used for projection in this study is the extension of historical trends. Knowledge of planned activities has a very short term utility and has the added danger of the introduction of bias. Consequently, in this study the knowledge factor is used only for the verification of predicted trends and as background information in sub-basin descriptions. The factor pertaining to constraints upon develop-ment is used in this study to exclude wetlands from being projected for development, as it is assumed that various governmental regulations will prevent or greatly deter such conversion.

Unfortunately, the useable data record of historical land use in the study area is not long (1978 to 1986). However, it is the opinion of the investigator, a professional geographer and a resident of the study area for over thirty years, that occurrences during this period of record reflect longer term trends in the urbanization of the area.

Allocation

The major conversion of lands to urban use occurs in the residential and commercial land use categories. Residential use is, of course, tied to population. The relationships between population and residential land

use form the basis for projection. The following process is used to determine future residential and commercial increases in the study area.

1. Determine the acreage of total residential growth (between 1978 and 1986) for each subbasin and for the total study area.

2. Divide residential growth for each subbasin by the total residential growth in the study area. This provides the percentage of growth to be alloted to each subbasin.

3. Determine the relationship between residential growth and population growth by dividing the total acreage growth by the population increase experienced between 1978 and 1986.

4. Using projected population (see Table) accordingly project residential growth then allocate to individual basins as determined in step 2.

These steps provide the basic information to project residential growth in the study area. Commercial land use is somewhat related to residential land use. However, certain areas are commercial centers while other areas are free of commercial development. Consequently, individual subbasins vary greatly in the relationship between commercial land use and residential land use. In order to devise a rational method of projecting commercial land use with available information, the data for residential growth and commercial growth were examined to find categories of this relationship and to quantify these categories. The following categories were established.

1. Very low commercial growth
Subbasins in this category are rural, "end-of-the-line" areas. They are either without commercial centers or have very small centers which have fully developed their potential. Any commercial growth would be for facilities such as convenience stores. No commercial growth is assigned to these areas in the projections.

2. Low commercial growth
These areas, while rural, are either near commercial centers which may have some "spill-over" effect or are along major transportation routes, or contain small commercial centers with some potential for growth. The commercial to residential growth ratio for these areas is 0.044.

3. Moderate commercial growth
These subbasins are near center city or other rapidly developing areas. Considerable "spill-over" can be expected. Commercial development will exceed local needs. The ratio for these areas is 0.134.

POPULATION PROJECTIONS
FOR
AMITE RIVER BASIN STUDY AREA

	1970	1978[2]	1980	1986	1990	2000	2010[2]	2020[2]	2030[2]	2040
Ascension[1]	26,260	36,153	38,626	46,576	49,107	54,712	59,779	63,975	67,300	70,862
East Baton Rouge	285,167	343,096	366,191	392,547	408,100	442,000	471,650	499,775	519,925	541,000
Livingston[1]	27,275	42,493	46,297	57,994	62,157	72,905	80,838	85,938	78,777	92,763
Iberville[1,3]	3,215	3,989	4,182	5,065	5,654	6,568	7,761	8,954	10,147	11,340
TOTAL	341,917	425,731	455,296	502,182	525,018	576,185	620,028	658,642	687,149	715,965

1. Portion in Amite River Basin Study Area
   Percentage of growth relative to entire parish based upon 1970-80 experience

2. Data interpolated assuming constant growth rate

3. Iberville data obtained from Population Projections to 2000 for Louisiana, University of New Orleans and Louisiana State Planning Office, 1983. Data beyond year 2000 projected at rate from 1980-2000.

Base population data supplied by Corps of Engineers unless otherwise noted.

4. High commercial growth
These subbasins contain the small urban centers of Zachary, Baker, Denham Springs and Gonzales; and the rapidly developing areas of south and southeastern Baton Rouge. Additionally, these areas contain major highways which provide high potential for future development of market centers. The ratio for these areas is 0.650.

5. Very high commercial growth
Subbasins in this group are nearly fully developed and are located in or near downtown Baton Rouge. The large parcels of land prefered by developers for residential growth are not available and the land costs are high. As a result commercial development is more likely to occur than residential. The ratio for these subbasins is 1.1.

Projections of increases in commercial land use are made in this study by applying the appropriate ratio to the residential growth for each subbasin.

Industrial projections are somewhat more difficult to determine than are projections for residential and commercial lands. This is due to a variety of influences beyond the scope of analysis in a study of this scope. Due to the greater impact of these unpredictable influences upon industrial land uses, this study does not project future industrial areas for individual subbasins. Rather these projections are made for "regions" which are groups of subbasins defined in the Discussion section of this study. The industrial land use projections are extensions of the trend established between 1978 and 1985.

Disallocation

The increase of urban land uses causes a decrease in the non-urban land uses. For the purposes of this project all urban growth will be accommodated from agricultural and forested lands (termed "available land" in this study.) Examination of the data for the period 1978 to 1985 indicates that a given piece of agricultural land is more likely to be converted to urban uses than a given piece of forested land. The relatively greater propensity for conversion for agricultural land is the result of two factors: location and ease. "Location", in this case, refers to the greater concentration of agricultural land near urban centers and "ease" refers to the various characteristics of agricultural land which make its conversion to urban uses more cost effective. In the process of predicting future land uses, location is automatically taken into consideration because subbasins near growth centers will have a relatively greater "draw" (i.e. more land will be converted and therefore proportionately more agricultural land.) This leaves only the "ease" factor to be determined.

To acquire the "ease" factor, the first step is to establish how much agricultural land would have been converted in each subbasin if there were no greater utility to converting agricultural land over forested land.

If this were the case forested and agricultural lands would be converted proportionate to their presence in the subbasin. The "ease" factor is therefore determined by comparing proportional conversion rates to actual conversion rates using the following equation:

$$\frac{\text{'78 Ag. Land}}{\text{'78 Total Available Land}} = \frac{\text{'78 to '85 Change in Ag. Land}}{\text{'78 to '85 Change in Total Available Land}}$$

The sum of the actual changes in all subbasins is divided by the sum of the predicted changes (obtained using the equation). The result is the factor to be applied to explain the "ease" of converting agricultural land.

Thus, when predicting disallocation the following formula will be applied to each subbasin:

$$\text{Change in Ag. Land} = (\text{"ease" factor})\ \frac{\text{Total Change x Ag. Land}}{\text{Total Available Land}}$$

This is simply the solution for the quantity "Change in Ag. Land" from the first formula with the "ease" factor included.

Using the '78 to '85 data the "ease" factor was determined to be 1.19. This means that, independent of location, a given acre of agricultural land has a 19% greater chance of being converted to urban uses than would be expected from random or proportional chance. This factor will be applied in predicting disallocation for this study.

Reflective of patterns observed in subbasins which are already fully developed in the study area, five percent of each subbasin is reserved from development and retained in the forested category. This reserve represents parcels of land which remein undeveloped due to poor development characteristics such as lack of access, poor soil conditions and high flood potential.

Conversion of Forest to Agriculture

The period of 1978-85 was an era of strong incentives for farmers to clear land for increased production. Federal crop subsidies, good market prices (during the early part of this time), and tax credits for the expenses of clearing resulted in the conversion of large acreages of forests. However, during this period the study area experienced a net conversion of only 2901 acres of forest to agriculture, less than one percent of the 1978 total forest area. The northern sector indeed had a slight increase in forested area at the expense of agriculture. The two southernmost regions, the Lower Basin and Ascension, did have significant conversion of forest to agriculture. In the Ascension Region 3.1% of the forest was converted. The riverine farms of this area are large and mechanized and well suited to benefit from the federal programs which encouraged clearing of the marginally productive

lands lying away from the river. The 2.3% conversion in the Lower Basin probably resulted from the opening of lands for cattle production as this is not a major crop area.

Since 1985 federal legislation has greatly reduced incentives to clear land for farm production. These new policies which discourage opening of marginal land will probably result in considerable lessening in the amount of forested lands cleared and in some areas actually cause a reversion of farmed land to forest.

Within the study area it is unlikely that forest land will be converted to agriculture at a significant rate. This is demonstrated by the conservativeness of the rate during a time with great incentives to agriculturize. Present federal agricultural policy discouraging conversion is likely to remain in force in the near term. It is not possible to predict future policy in this area as many factors, both economic and political are involved. For these reasons no numerical projection of conversion from forest to agriculture is made in this study.

Discussion of Findings

General

The projections produced using the previously described methodology indicate a strong growth trend for the Baton Rouge urbanized area towards the east southeast. The transportation facility provided by Interstate 10 and the Airline Highway is undoubtably a major factor in the directionality of this growth. A second axis of growth toward the east along Interstate 12 is also highly significant. Growth to the north and northeast is weak, though the Zachary area appears to have the strongest history of development in the sector.

It should be recalled that these projections are extensions of past trends of development. Baton Rouge has plenty of available land for expansion in all directions from the city. Factors such as highway improvements, changes in attitudes toward certain areas, and the location of major employers could all influence variances from the patterns predicted by the historical trends used for the projections in this study.

For the purposes of discussion, the subbasins have been grouped into eight "regions"(see map). These are: the Northwest region, the Northeast region, the Central region, the Baton Rouge Urban region, the Livingston region, the Southern region, the Ascension region and the Lower Basin region.

°15'00'
91°00'00'
90°45'00'
STUDY REGIONS
NORTHWEST
NORTHEAST
CENTRAL
URBAN
LIVINGSTON
SOUTHERN
ASCENSION
LOWER BASIN
1
2
3
4
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-BASINS

The Northwest Region

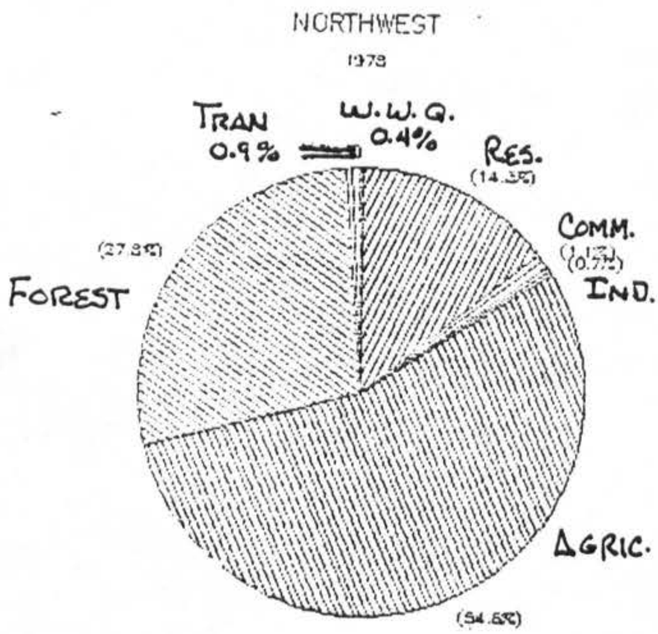
(Subbasins 1,2,3,4,5,6,7,8,9,10,12,13)

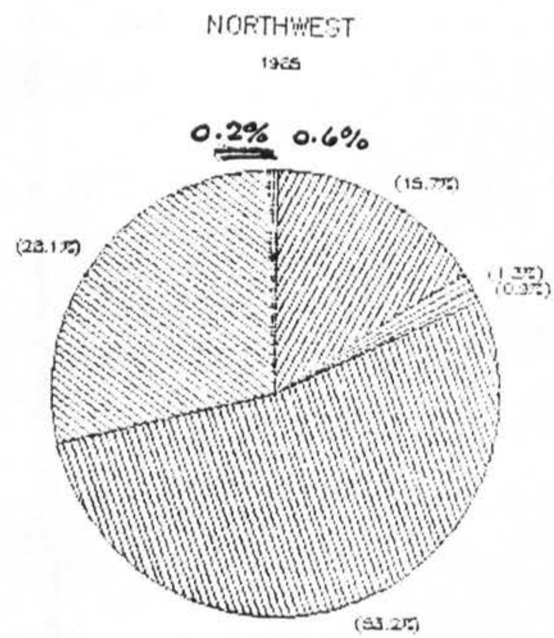
This is an area of generally slow growth. In the time period preceeding the period of record for this study, the area experienced a more rapid expansion due to the "urban retreat" of many of the blue collar workers from the industrial facilities of north Baton Rouge. These facilities have decreased employment in recent years and the growth of the area has correspondingly declined. Within the study period most to the growth recorded occurred in the area around Zachary. This is probably due, in part, to the influx of workers for the construction of the River Bend Nuclear Generator several miles to the north. Subbasin 1, located to the west of Zachary is the most rapidly growing area. Basins 4,5,6, and 12 indicated no growth during the period 1978 to 1986. This pattern of growth predicted appears reasonable except for subbasin 12, to the east of Baker. While future growth for this subbasin is not likely to be rapid, the prediction for no growth is equally unlikely. This anomaly is not of great significance as the growth that will occur in this basin is probably mostly accounted for in the model's projections for surrounding subbasins.

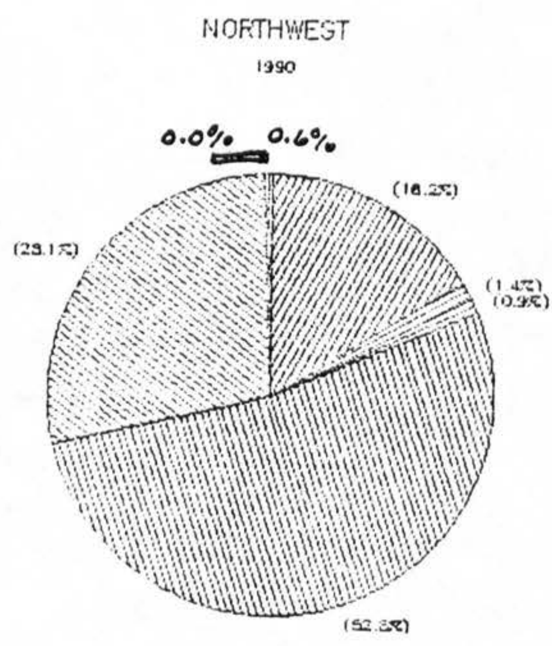
In summary, the Northwest region is not projected to be a rapid growth area in the future. About 7.8% of the total growth in the study area is slated for this area which makes up over 13% of the total acreage in the study area.

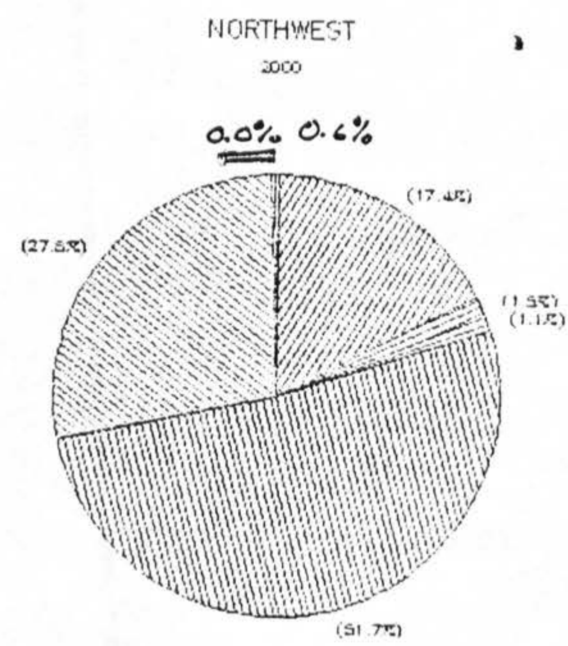
Existing Data and Projections
Land Use in the Northwest Region
1978 - 2040

Year	Residential	Commercial	Industrial	Agriculture	Forest	Transition	Water, Wetland, Quarry
1978	14,671	1,095	771	56,357	28,603	969	365
1985	16,158	1,356	882	54,718	28,896	251	572
1990	16,653	1,404	962	54,286	28,872	86	572
2000	17,848	1,513	1,141	53,141	28,614	0	572
2010	18,925	1,619	1,320	52,015	28,382	0	572
2020	19,942	1,715	1,499	50,952	28,154	0	572
2030	20,777	1,795	1,678	50,058	27,952	0	572
2040	21,648	1,877	1,857	49,140	27,739	0	572


NORTHWEST
1978
TRAN
0.9%
W.W.Q.
0.4%
RES.
(14.3%)
COMM.
(1.1%)
(0.7%)
IND.
(27.8%)
FOREST
AGRIC.
(54.6%)

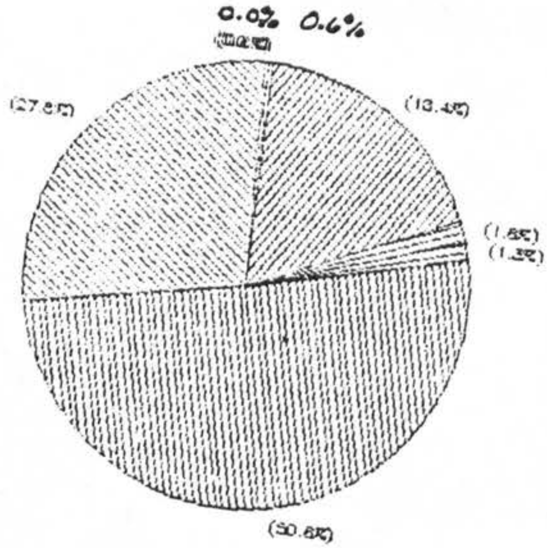

NORTHWEST
1985
0.2%
0.6%
(15.7%)
(28.1%)
(1.3%)
(0.9%)
(53.2%)


NORTHWEST
1990
0.0%
0.6%
(16.2%)
(28.1%)
(1.4%)
(0.9%)
(52.8%)


NORTHWEST
2000
0.0%
0.6%
(17.4%)
(27.5%)
(1.5%)
(1.1%)
(51.7%)

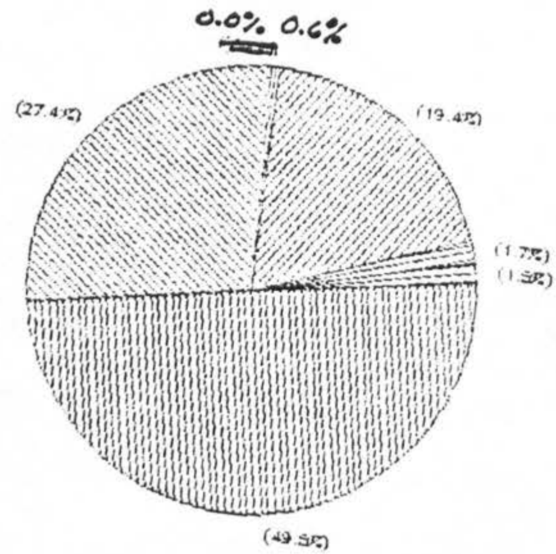
NORTHWEST

2010



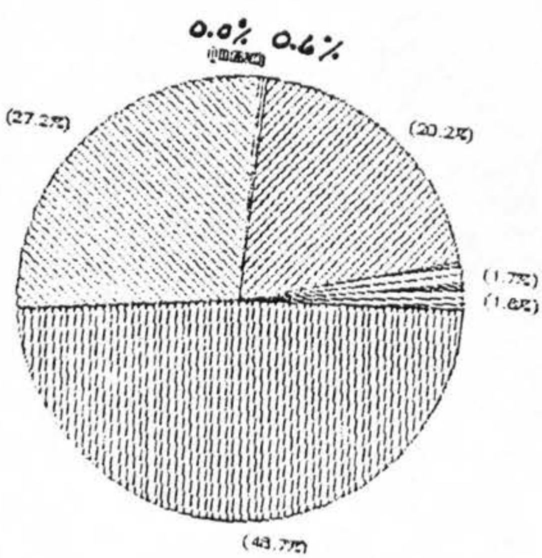
NORTHWEST

2020



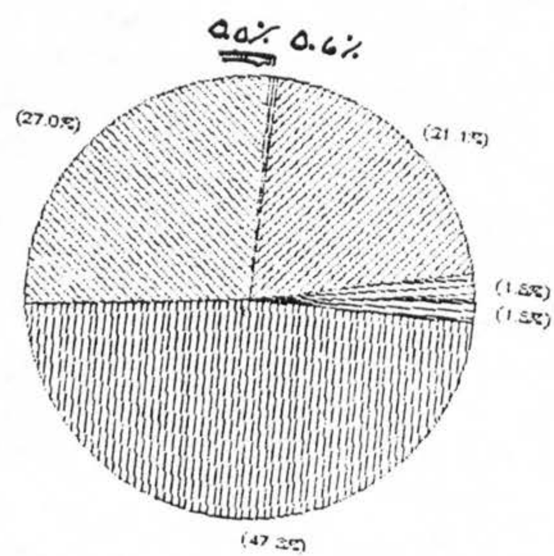
NORTHWEST

2030



NORTHWEST

2040



The Northeast Region

(Subbasins 53,55,56,57,58)

The northeast is an area of very slow growth. Transportation routes to the area are not well developed and the area is distant from major employers. Much of the land in subbasins 55, 56, 57, and 58 is within the actual valley of the Amite River and is ill suited to development. The remaining subbasin, 53, is projected for slow growth which might increase upon the improvement of transportation to the area.

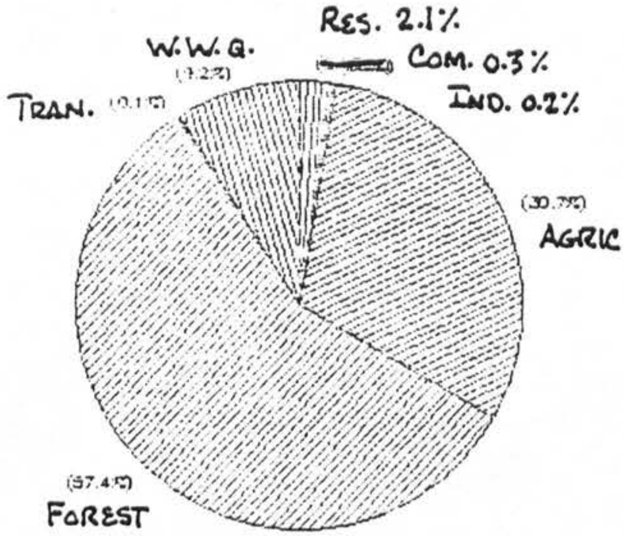
This area is not likely to contribute greatly to the problems associated with development within the forseeable future. The entire area is slated for only about 1.5% of the growth for the study area while it covers about 12% of the total area.

Existing Data and Projections
Land Use in the Northeast Region
1978 - 2040

Year	Residential	Commercial	Industrial	Agriculture	Forest	Transition	Water, Wetland, Quarry
1978	1,955	258	196	28,666	53,599	110	8,551
1985	2,325	284	196	28,104	53,157	47	9,261
1990	2,421	287	196	28,055	53,106	47	9,261
2000	2,654	295	196	27,937	52,985	47	9,261
2010	2,862	301	196	27,832	52,874	47	9,261
2020	3,060	308	196	27,731	52,770	47	9,261
2030	3,222	313	196	27,649	52,685	47	9,261
2040	3,391	319	196	27,563	52,596	47	9,261

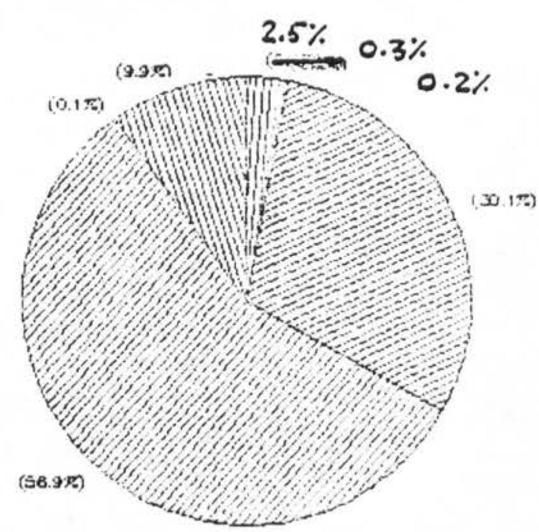
NORTHEAST REGION

1978



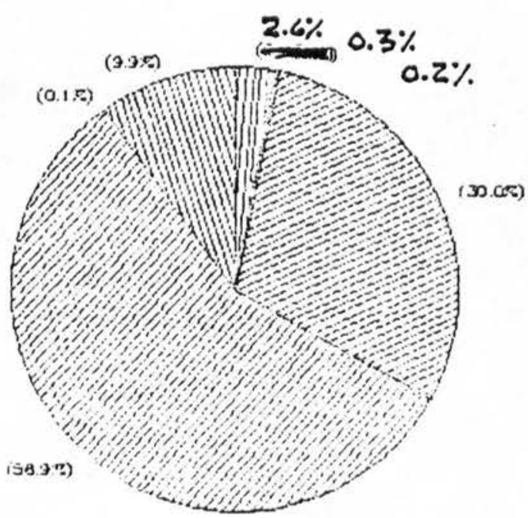
NORTHEAST REGION

1985



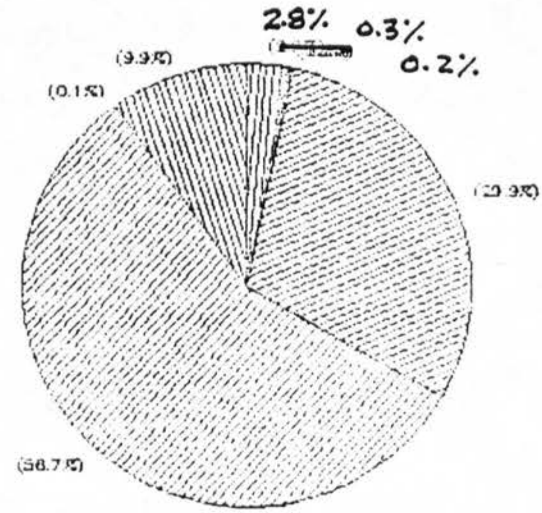
NORTHEAST REGION

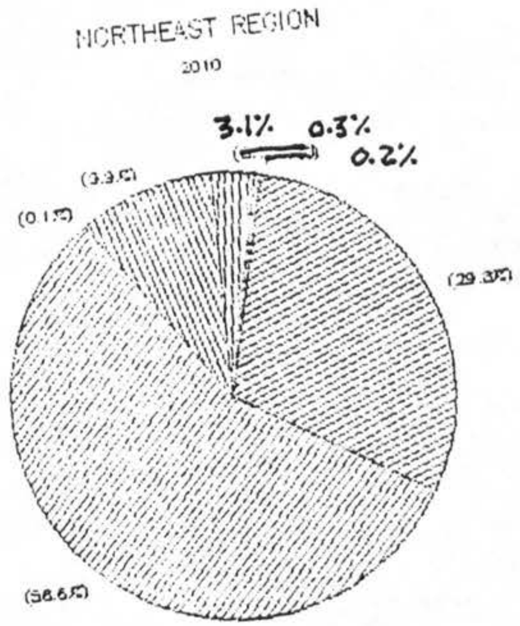
1990

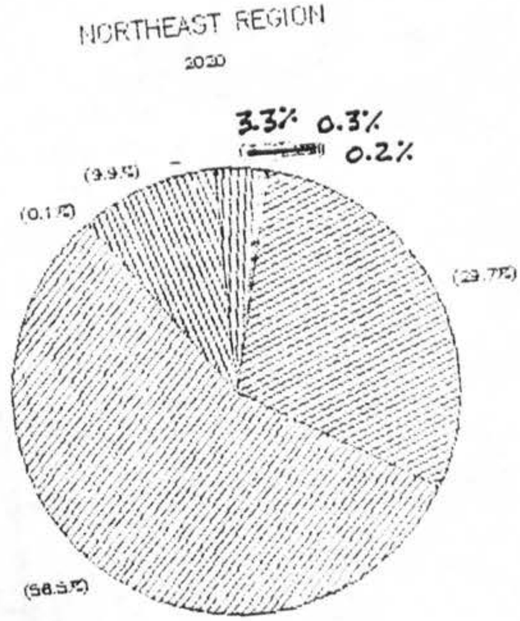


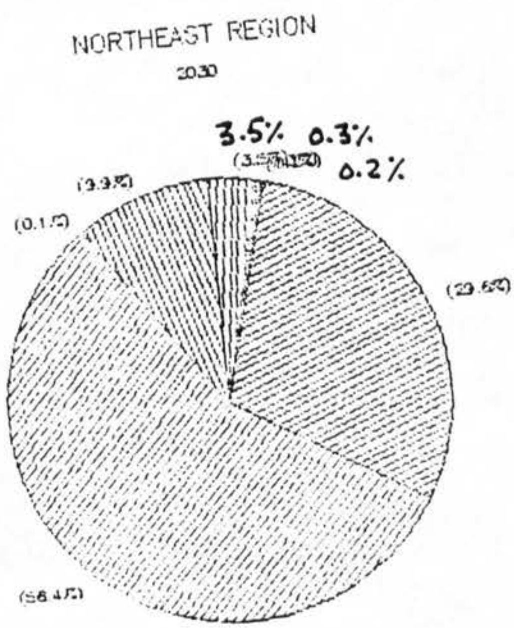
NORTHEAST REGION

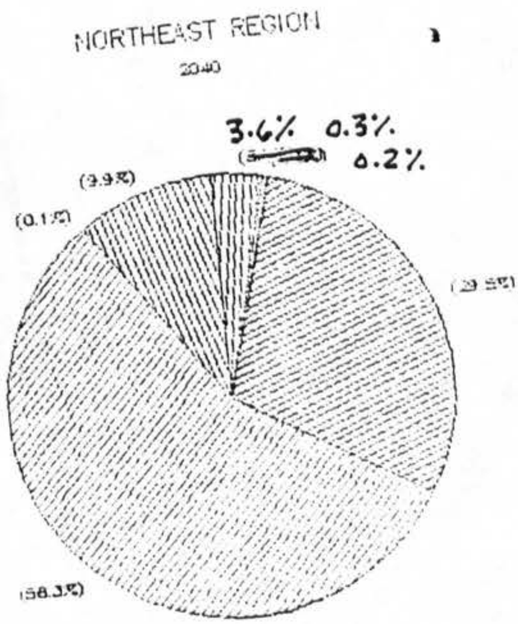
2000




NORTHEAST REGION
2010
3.1% 0.3%
0.2%
(3.9%)
(0.1%)
(29.3%)
(58.6%)


NORTHEAST REGION
2020
3.3% 0.3%
0.2%
(3.9%)
(0.1%)
(29.7%)
(58.5%)


NORTHEAST REGION
2030
3.5% 0.3%
0.2%
(3.9%)
(0.1%)
(29.6%)
(58.4%)


NORTHEAST REGION
2040
3.6% 0.3%
0.2%
(3.9%)
(0.1%)
(58.3%)

The Central Region

(Subbasins 14, 17, 18, 19, 54)

This area, located to the northeast of urbanized Baton Rouge, is likely to experience moderate growth in the future. Though transportation routes are inadequate, the area is near enough to the urbanized area to be highly likely to receive continued development. Portions of the region are within the valleys of the Amite and Comite and not suitable for development, which fact has and will continue to limit the growth in the area. Improvements to the transportation facilities in the area would likely increase the growth potential.

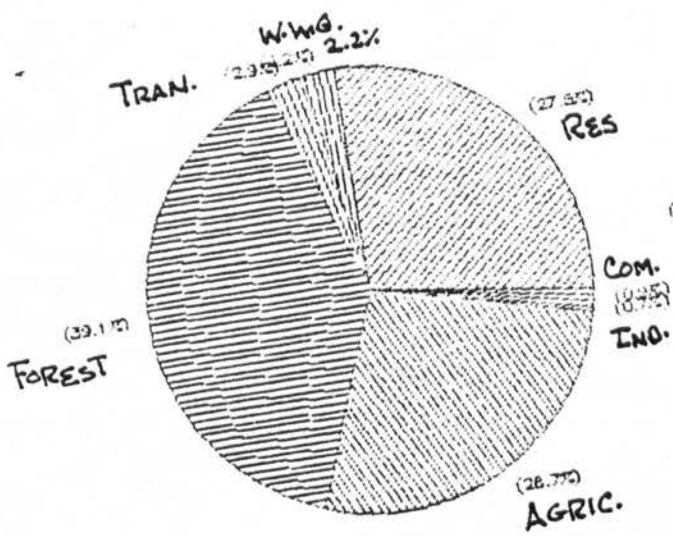
The Central region, while away from the growth focus for the study area, is likely to experience development at a nearly average rate for the study area. This area, representing roughly 4% of the study area, is projected to receive 3.5% of the study area growth.

Existing Data and Projections
Land Use in the Central Region
1978 - 2040

Year	Residential	Commercial	Industrial	Agriculture	Forest	Transition	Water, Wetland, Quarry
1978	8,217	277	209	8,003	11,703	861	649
1985	9,067	318	209	7,808	11,550	223	743
1990	9,297	334	209	7,672	11,571	92	743
2000	9,849	374	209	7,385	11,278	80	743
2010	10,349	410	209	7,055	11,075	78	743
2020	10,819	444	209	6,746	10,881	76	743
2030	11,207	471	209	6,495	10,719	74	743
2040	11,611	500	209	6,235	10,548	73	743

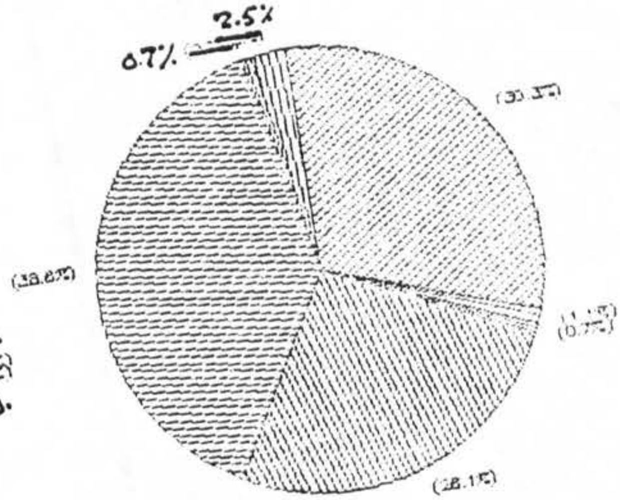
CENTRAL

1978



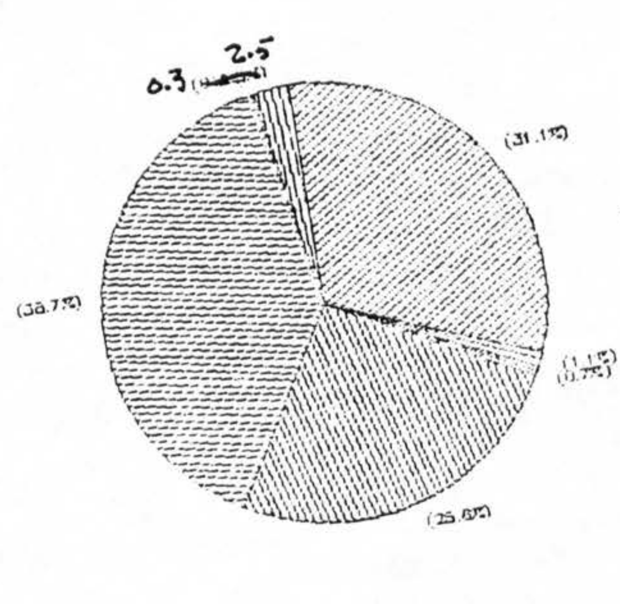
CENTRAL

1985



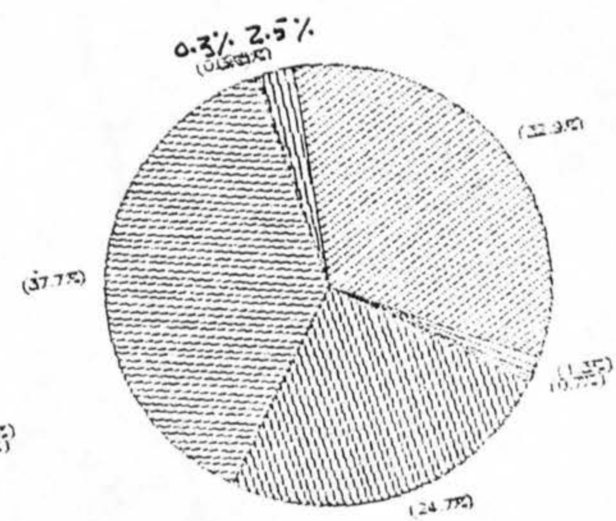
CENTRAL

1990



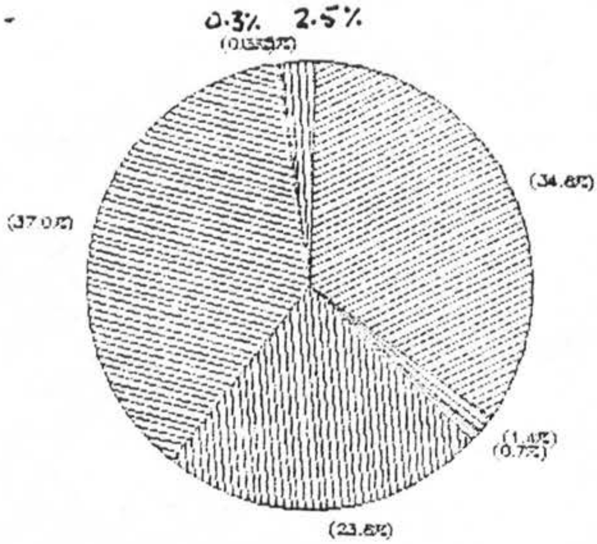
CENTRAL

2000



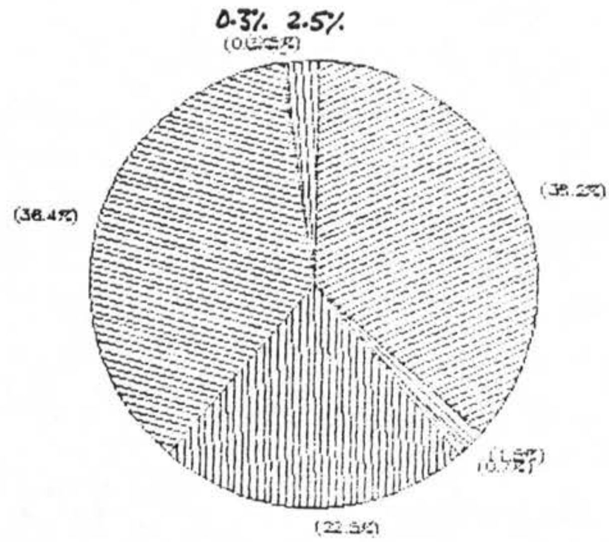
CENTRAL

2010



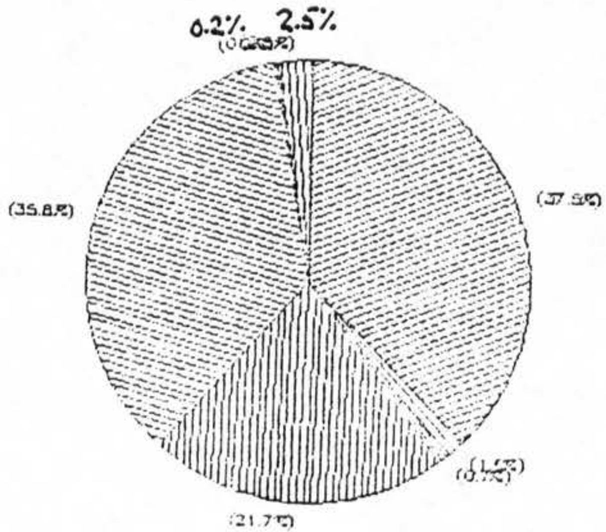
CENTRAL

2020



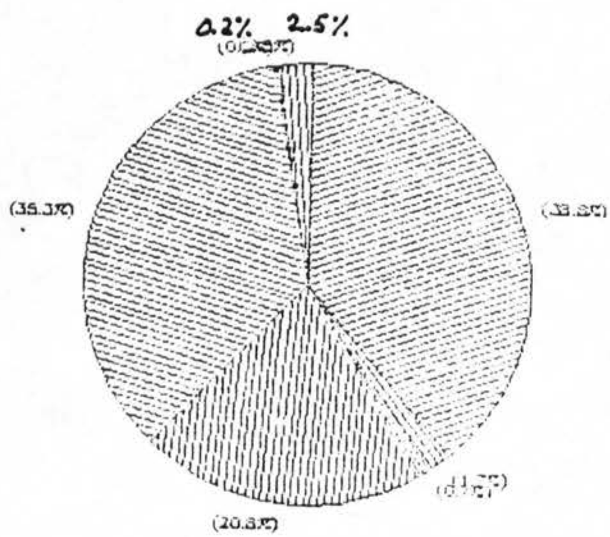
CENTRAL

2030



CENTRAL

2040



The Baton Rouge Urban Region

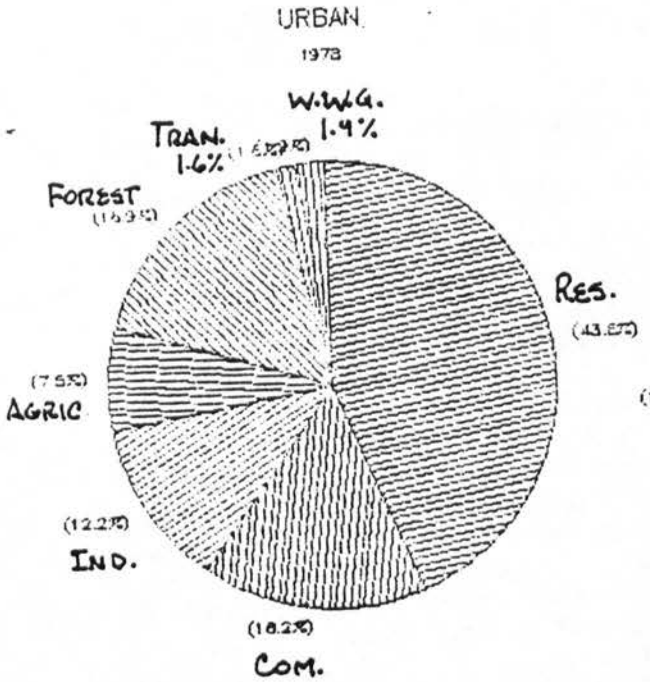
(Subbasins 11, 15, 16, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 48)

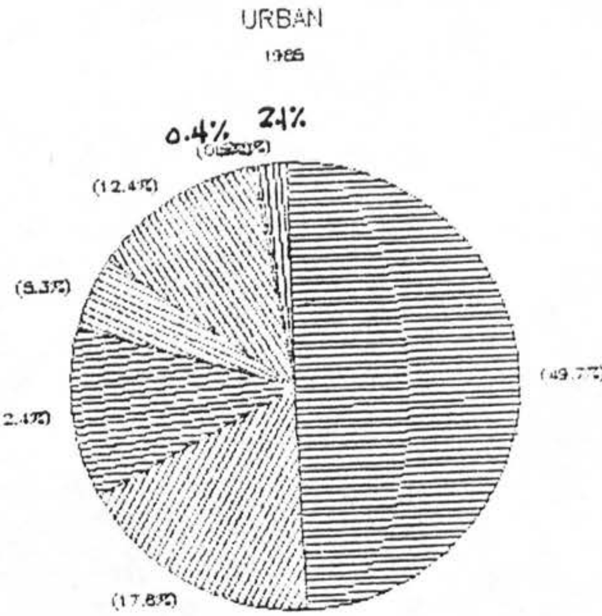
This is the portion of the study area which is already heavily urbanized. Several of the subbasins are virtually completely developed at the present time (11, 15, 20, 23, 26, 27). Areas in the southern and eastern parts of this area are projected to become fully developed early in the projection period. The only subbasins not projected to be fully developed by 2040 are 16 (to the north), 24, and 48. While subbasin 16 is not likely to grow rapidly, subbasins 24 and 48 will likely become fully urbanized in the mear future. The model apparently mispredicted for these two in part due to their small size. Subbasin 21 is not projected for full urbanization until 2030. This subbasin contains two large parcels of land, the Burden tract and the Whitter tract, which may not develop in the foreseeable future. The Burden tract is administered by the Louisiana State University College of Agriculture as a park area and a research farm. The Whitter tract is owned by an individual who wishes the area remain in farmland and forest. Most of the remainder of the subbasin is fully developed at the present time.

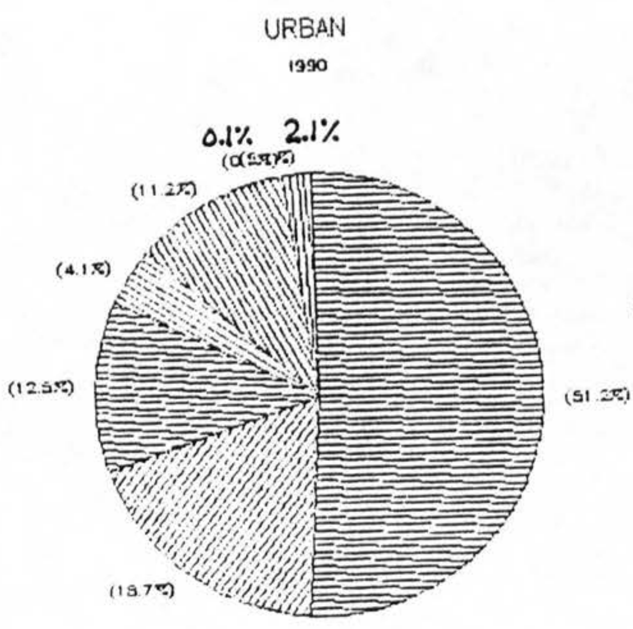
This region is projected to experience 14.9% of all growth in the study area despite its present high degree of urbanization and small areal extent of less than 8% of the total study area.

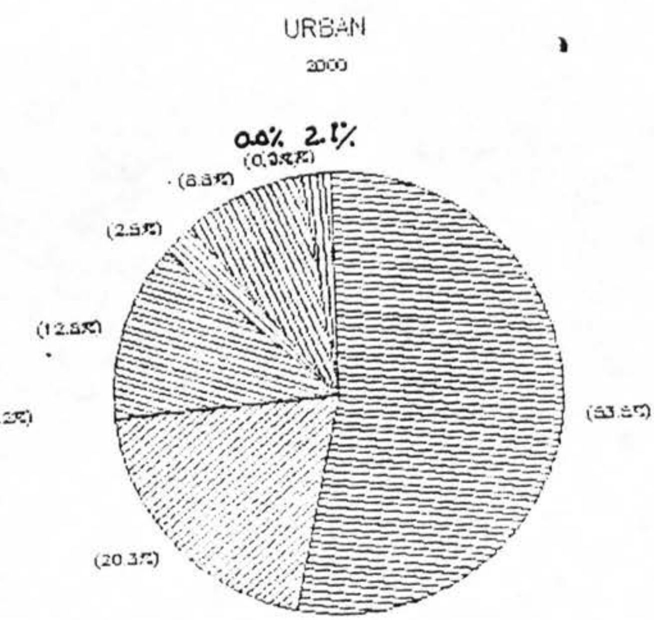
Existing Data and Projections
Land Use in the Urban Region
1978 - 2040

Year	Residential	Commercial	Industrial	Agriculture	Forest	Transition	Water, Wetland, Quarry
1978	26,809	9,941	7,451	4,563	10,316	961	1,173
1985	30,431	10,783	7,576	3,258	7,608	297	1,261
1990	31,369	11,459	7,665	2,531	6,880	46	1,261
2000	32,776	12,401	7,844	1,537	5,393	0	1,261
2010	33,397	12,805	8,023	1,046	4,683	0	1,261
2020	33,929	13,150	8,202	739	3,933	0	1,261
2030	34,185	13,316	8,381	621	3,451	0	1,261
2040	34,429	13,476	8,560	430	3,061	0	1,261


URBAN
1978
W.W.G.
1.4%
TRAN.
1.6%
FOREST
RES.
(7.5%)
AGRIC
(12.2%)
IND.
(18.2%)
COM.

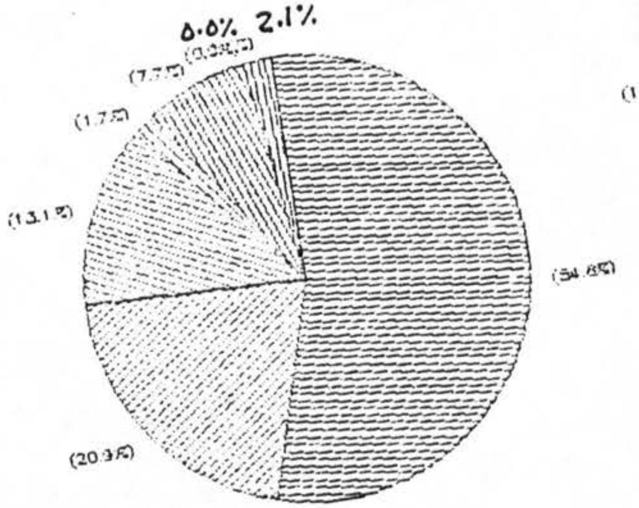

URBAN
1985
0.4%
2.1%
(12.4%)
(12.4%)
(17.8%)
(49.7%)


URBAN
1990
0.1%
2.1%
(11.2%)
(4.1%)
(12.5%)
(51.2%)


URBAN
2000
0.0%
2.1%
(2.5%)
(20.3%)

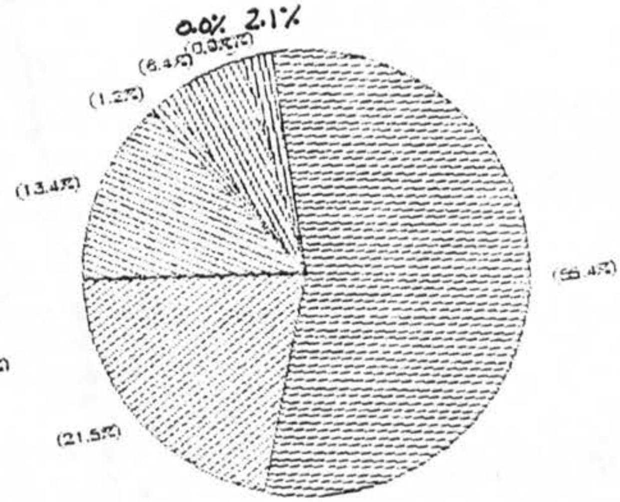
URBAN

2010



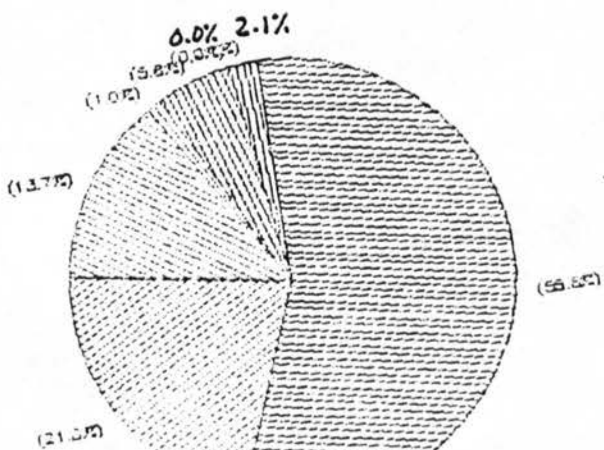
URBAN

2020



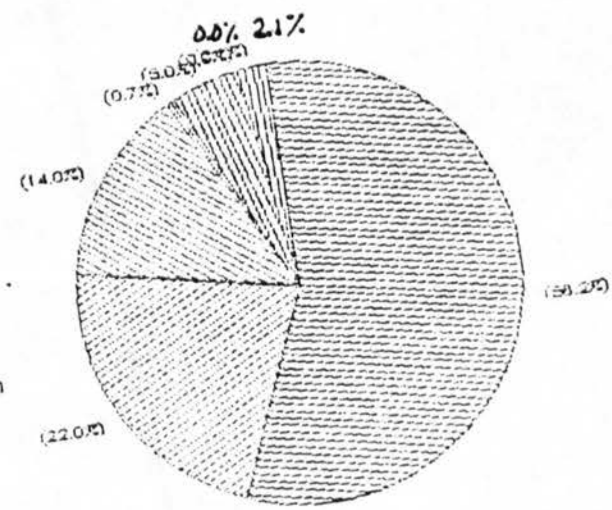
URBAN

2030



URBAN

2040



The Southern Region

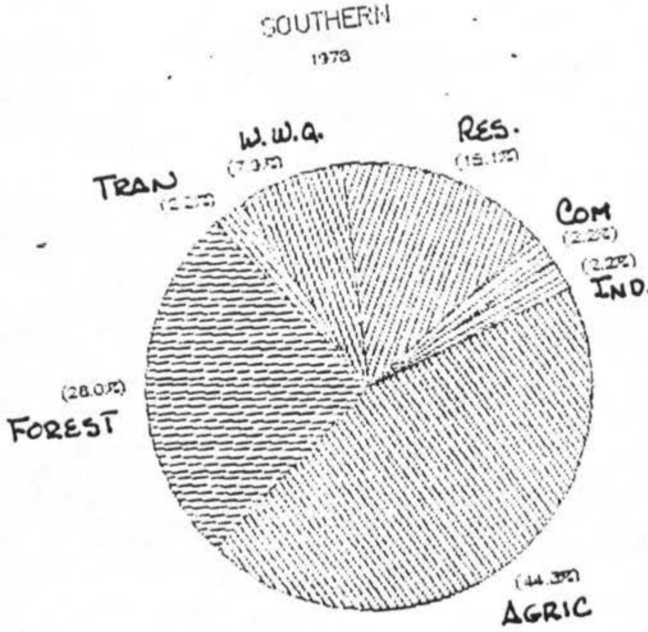
(Subbasins 29, 31, 32, 43, 60)

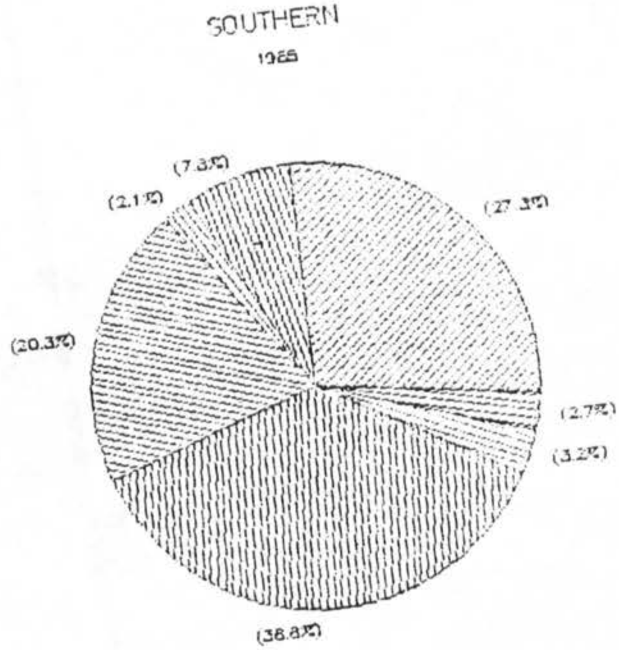
This rapidly developing region located to the south and southeast of the urbanized area contains the major traffic arteries, I-10 and Airline Highway. Major industrial sites are located along the Mississippi River portion of this region. The area serves as the place of residence for workers in both Baton Rouge and the river industries. Commercial growth is strong in the northern portion of the area, as well. Subbasins 43 and 60 will probably never become densely developed as much of the land is divided into parcels of one to five acres with single family residences located upon them. Subbasin 29 has a very great potential for growth as it is located quite near the center city of Baton Rouge and to the University, a major employer and it borders on the Mississippi River which provides opportunities for industrial expansion.

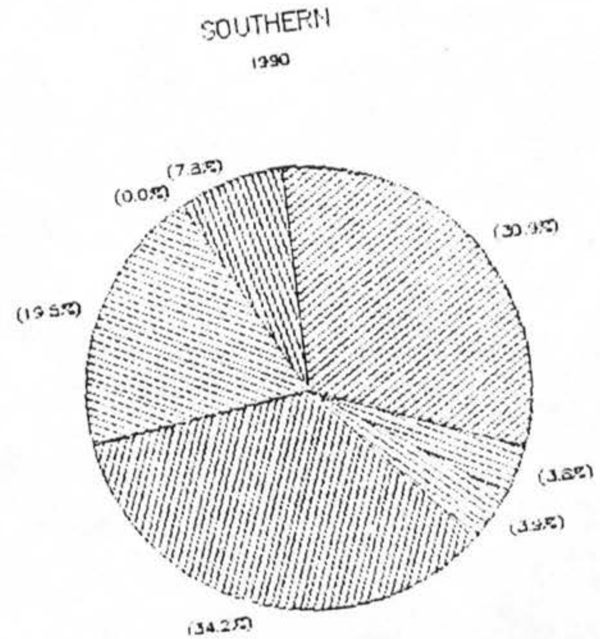
The five subbasins in this region, comprising only 7% of the study area, are projected to receive 29.7% of all growth in the study area. This region will show the greatest transformation of land uses by far.

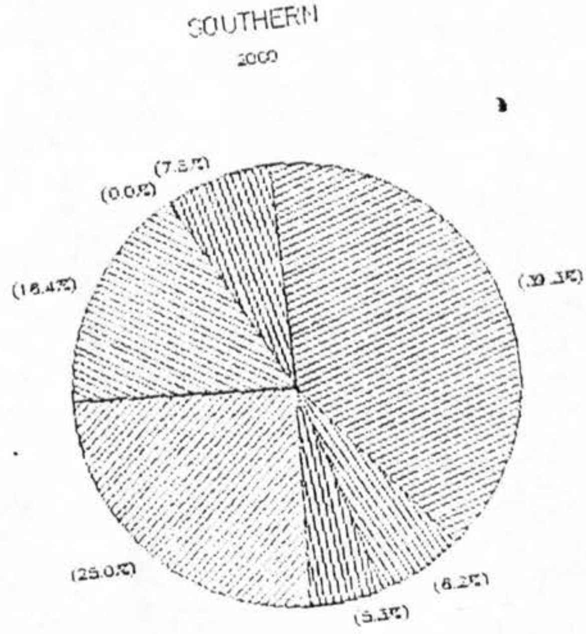
Existing Data and Projections
Land Use in the Southern Region
1978 - 2040

Year	Residential	Commercial	Industrial	Agriculture	Forest	Transition	Water, Wetland, Quarry
1978	8,212	1,214	1,217	23,998	14,105	1,171	4,399
1985	14,804	1,479	1,738	19,821	11,011	1,151	4,212
1990	16,752	2,035	2,110	18,553	10,553	0	4,212
2000	21,332	3,340	2,854	13,573	8,905	0	4,212
2010	25,492	4,528	3,598	9,420	6,968	0	4,212
2020	28,631	5,136	4,342	6,394	5,502	0	4,212
2030	30,481	5,499	5,086	4,456	4,483	0	4,212
2040	32,221	5,850	5,830	3,392	2,711	0	4,212


SOUTHERN
1978
TRAN
(2.2%)
W.W.Q.
(7.3%)
RES.
(15.1%)
COM
(2.2%)
(2.2%)
IND.
(28.0%)
FOREST
(44.3%)
AGRIC

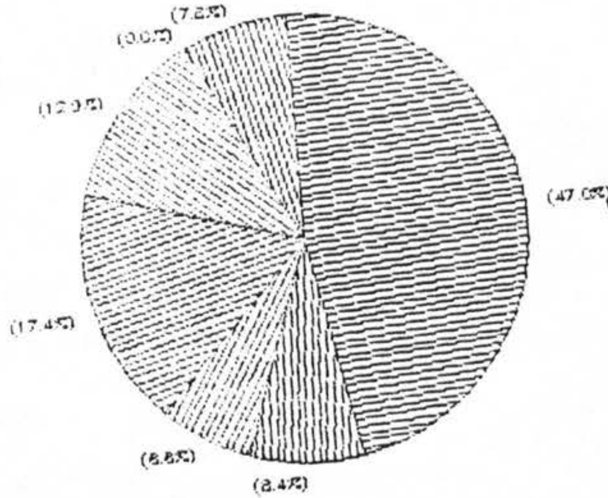

SOUTHERN
1985
(7.3%)
(2.1%)
(27.3%)
(20.3%)
(2.7%)
(3.2%)
(36.8%)


SOUTHERN
1990
(7.3%)
(0.0%)
(30.9%)
(19.5%)
(3.6%)
(3.9%)
(34.2%)


SOUTHERN
2000
(7.3%)
(0.0%)
(16.4%)
(39.3%)
(25.0%)
(6.2%)
(5.3%)

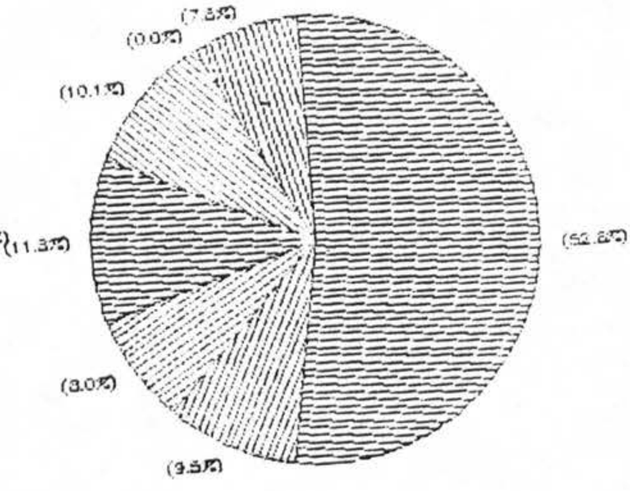
SOUTHERN

2010



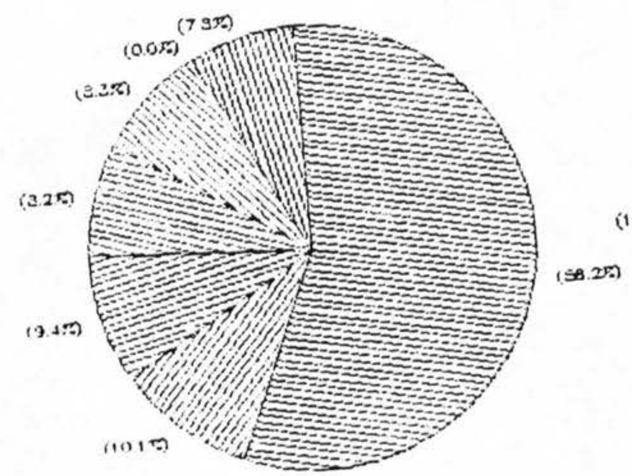
SOUTHERN

2020



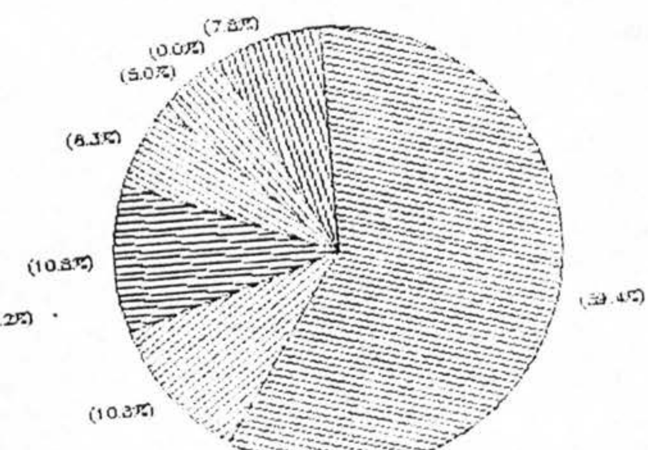
SOUTHERN

2030



SOUTHERN

2040



The Livingston Region

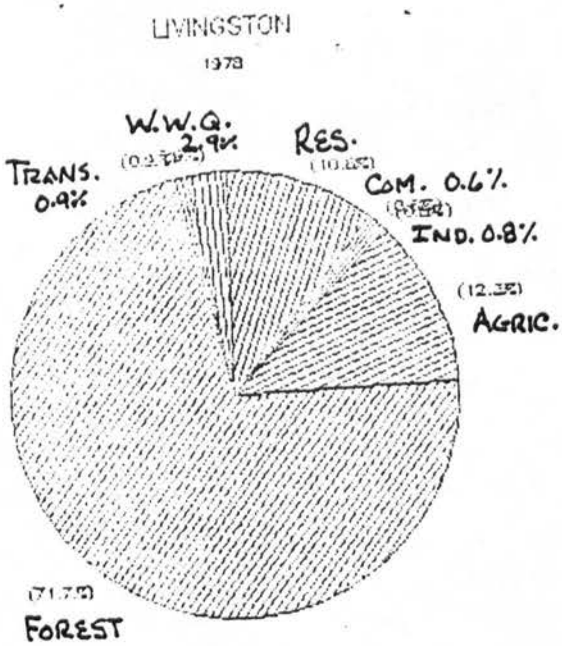
(Subbasins 45, 46, 47, 49, 50, 51, 52)

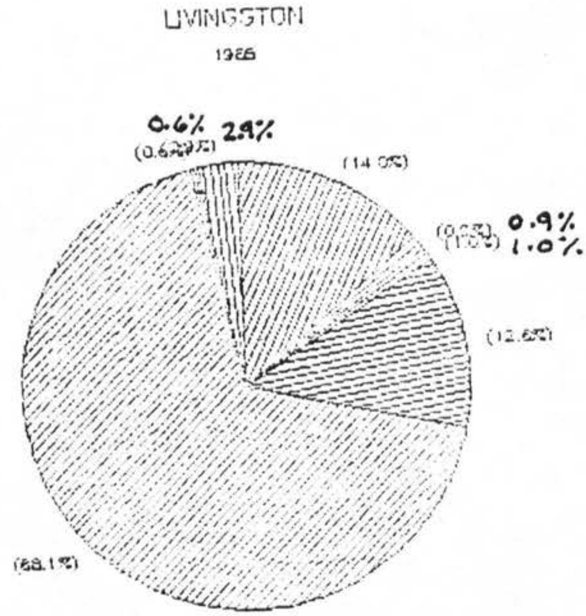
Interstate 12 passes through the center of this region and is likely to provide impetus for continued growth. The region contains the small urban center of Denham Springs and to the west it borders upon the urbanized area of Baton Rouge. The area contains abundant land well suited to development. Subbasins 46, 47, 51, and 52 lie partly within the Amite River flood plain and this will somewhat limit their potential for growth. However, all of these do contain land at higher elevations.

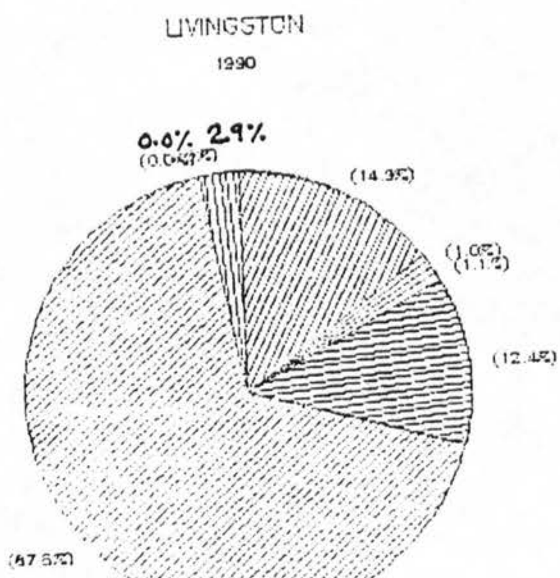
This area is project to receive 23.4% of the study area growth, only slightly above average for the study area as it contains over 21% of the land area.

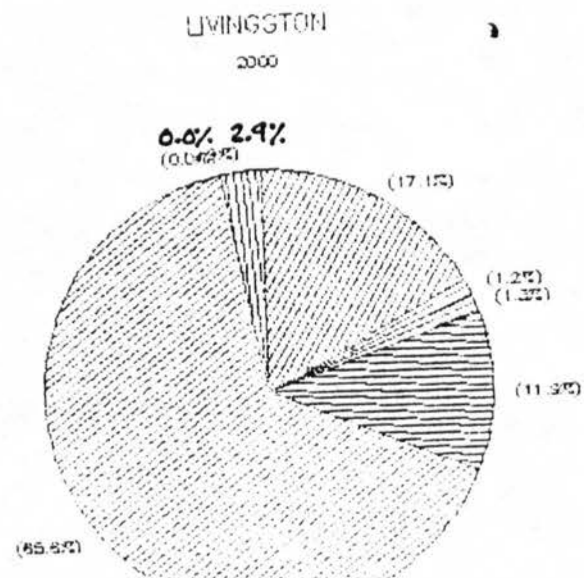
Existing Data and Projections
Land Use in the Livingston Region
1978 - 2040

Year	Residen-tial	Commer-cial	Indus-trial	Agricul-ture	Forest	Trans-ition	Water, Wet-land, Quarry
1978	17,252	1,060	1,310	20,264	118,187	1,489	4,715
1985	23,038	1.562	1,570	20,791	112,208	943	4,765
1990	24,552	1,672	1,756	20,397	111,737	0	4,765
2000	28,197	1,935	2,127	19,640	108,214	0	4,765
2010	31,484	2,171	2,498	18,797	105,161	0	4,765
2020	34,590	2,396	2,869	18,005	102,254	0	4,765
2030	37,140	2,580	3,240	17,348	99,804	0	4,765
2040	39,797	2,773	3,611	16,674	97,260	0	4,765


LIVINGSTON
1978
W.W.Q.
2.9%
RES.
(10.6%)
COM. 0.6%
IND. 0.8%
(12.3%)
AGRIC.
TRANS.
0.9%
(71.7%)
FOREST

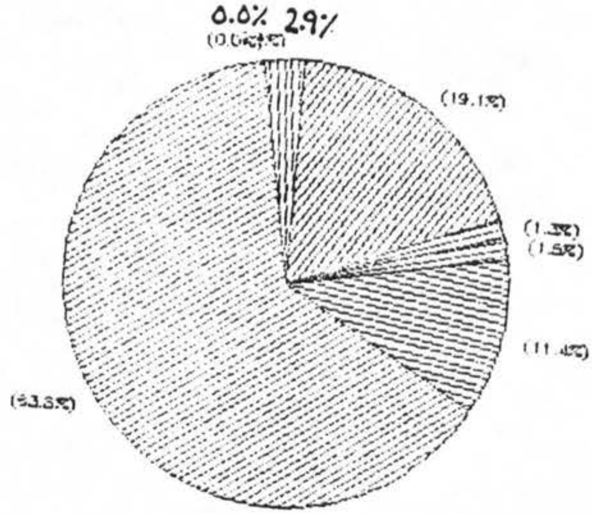

LIVINGSTON
1986
0.6% 2.9%
(14.0%)
0.9%
1.0%
(12.6%)
(68.1%)


LIVINGSTON
1990
0.0% 2.9%
(14.9%)
(1.0%)
(1.1%)
(12.4%)
(67.6%)


LIVINGSTON
2000
0.0% 2.9%
(17.1%)
(1.2%)
(1.3%)
(11.3%)
(65.6%)

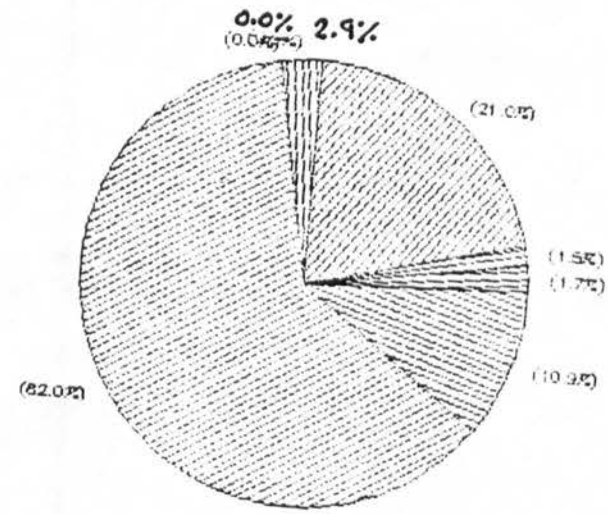
LIVINGSTON

2010



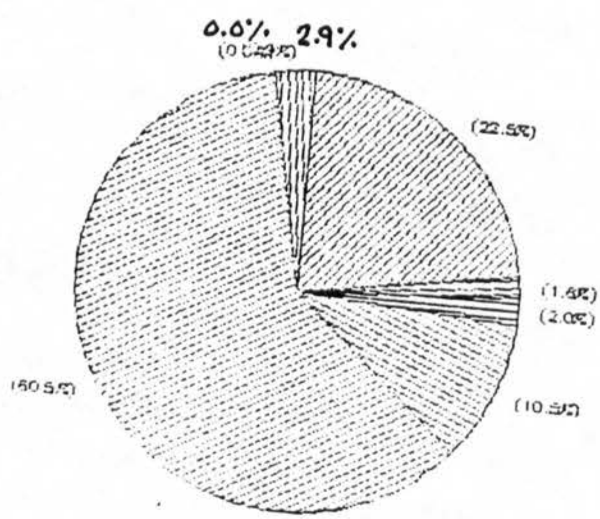
LIVINGSTON

2020



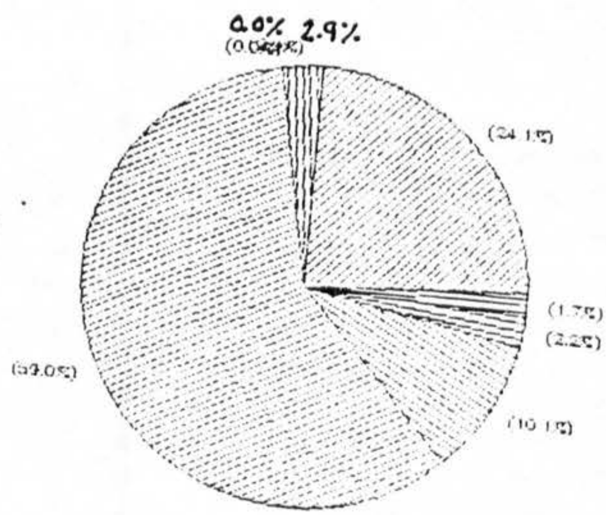
LIVINGSTON

2030



LIVINGSTON

2040



The Ascension Region

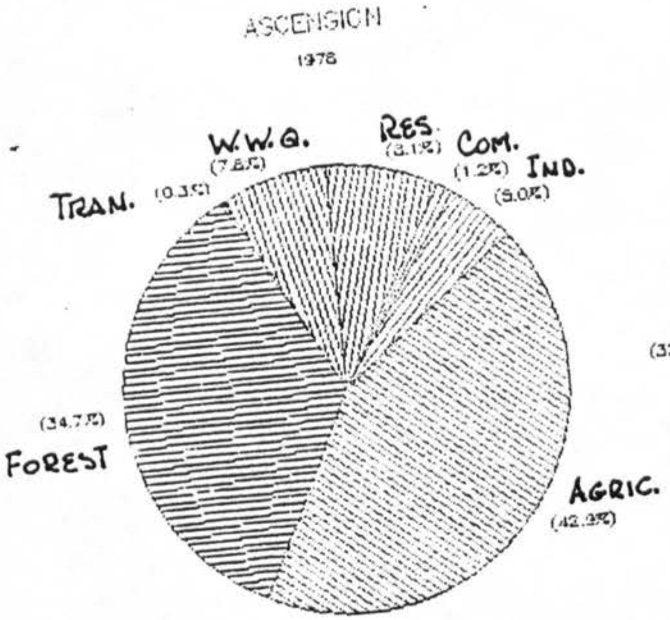
(Subbasins 33, 34, 35, 36, 37, 38, 39, 41)

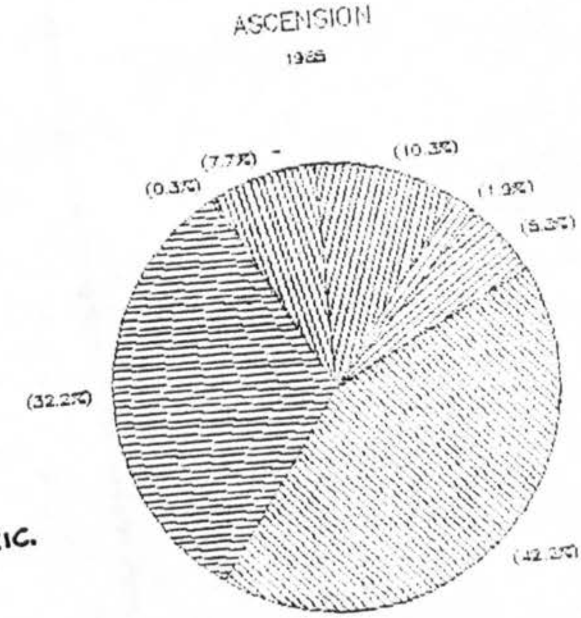
This region is composed of parts of both Ibberville and Ascension parishes. It contains the small urban center of Gonzales, I-10, the Airline Highway and a major industrial area located along the Mississippi. The potential for growth is obviously great. Employment is focused upon the river industries, which, while experiencing continued growth, have not expanded in recent years at the rapid rate of the early 1970's. Gonzales, though small, is located within five of the subbasins. This may result in some distortion of the projections for individual subbasins.

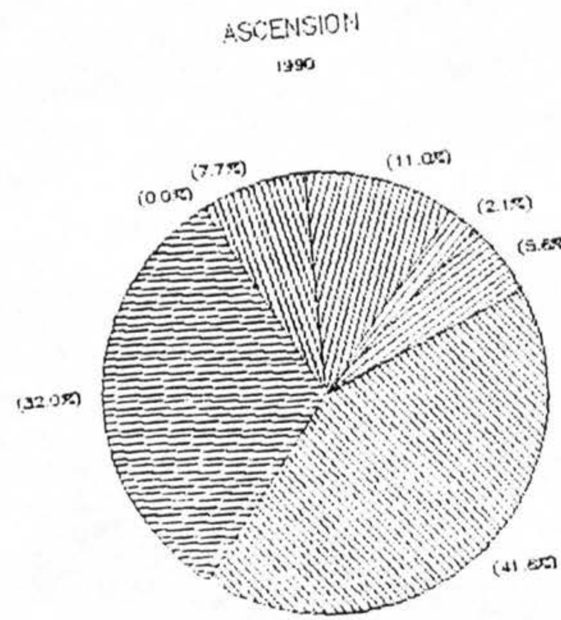
This region, containing 13% of the study area, is projected to receive 10.2% of the growth.

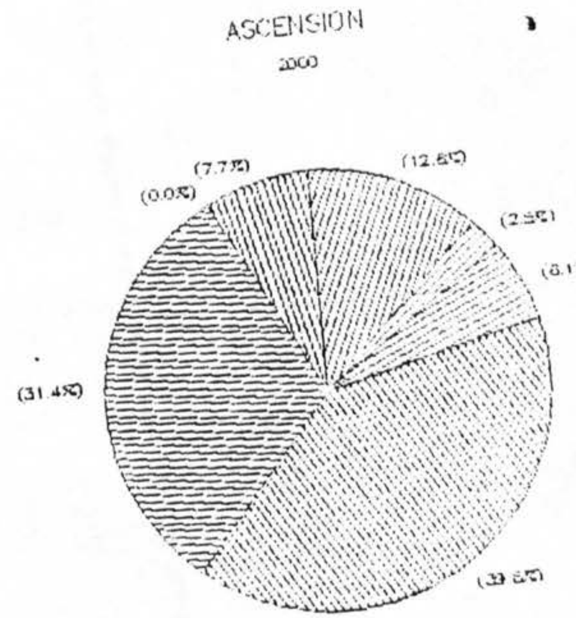
Existing Data and Projections
Land Use in the Ascension Region
1978 - 2040

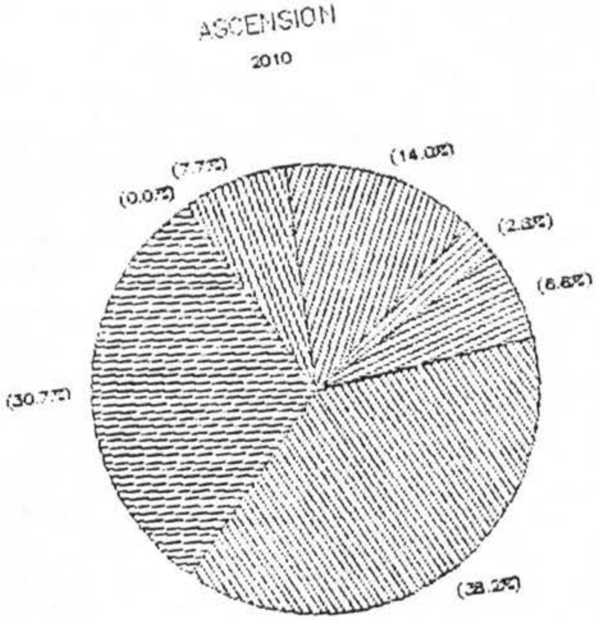
Year	Residen-tial	Commer-cial	Indus-trial	Agricul-ture	Forest	Trans-ition	Water, Wet-land, Quarry
1978	8,092	1,249	4,970	42,889	34,668	287	7,774
1985	10,334	1,939	5,320	42,154	32,206	287	7,686
1990	10,999	2,101	5,570	41,550	32,022	0	7,686
2000	12,562	2,476	6,071	39,784	31,345	0	7,686
2010	13,983	2,813	6,572	38,176	30,689	0	7,686
2020	15,327	3,139	7,073	36,662	30,035	0	7,686
2030	16,429	3,405	7,574	35,379	29,447	0	7,686
2040	17,577	3,683	8,075	34,072	28,831	0	7,686

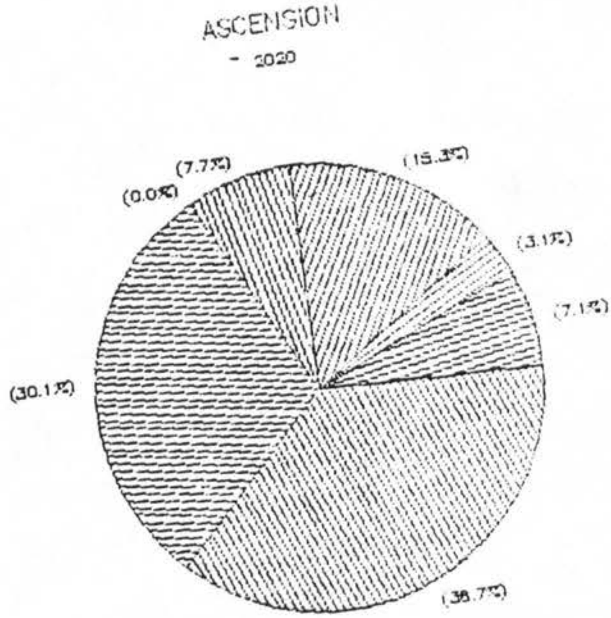

ASCENSION
1978
RES.
(3.1%)
COM.
(1.2%)
IND.
(5.0%)
W.W.Q.
(7.8%)
TRAN.
(0.3%)
(34.7%)
FOREST
AGRIC.
(42.3%)

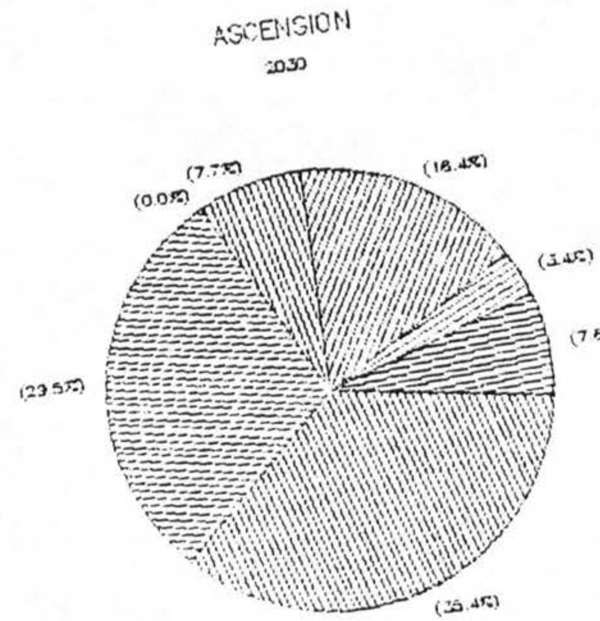

ASCENSION
1985
(7.7%)
(10.3%)
(0.3%)
(1.9%)
(5.3%)
(32.2%)
(42.2%)

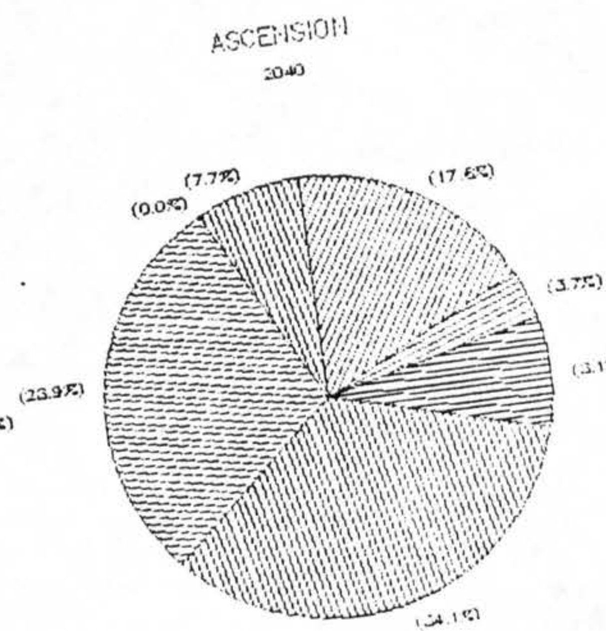

ASCENSION
1990
(7.7%)
(11.0%)
(0.0%)
(2.1%)
(5.6%)
(32.0%)
(41.6%)


ASCENSION
2000
(7.7%)
(12.6%)
(0.0%)
(2.5%)
(6.1%)
(31.4%)
(39.6%)


ASCENSION
2010
(0.0%)
(7.7%)
(14.0%)
(2.8%)
(6.6%)
(30.7%)
(38.2%)


ASCENSION
2020
(0.0%)
(7.7%)
(15.3%)
(3.1%)
(7.1%)
(30.1%)
(36.7%)


ASCENSION
2030
(0.0%)
(7.7%)
(16.4%)
(3.4%)
(7.6%)
(23.5%)
(35.4%)


ASCENSION
2040
(0.0%)
(7.7%)
(17.6%)
(3.7%)
(3.1%)
(23.9%)
(34.1%)

The Lower Basin Region

(Subbasins 40, 42, 44, 59)

This region contains a large amount of low-lying swamp. The only areas suitable for development are in the western portions of subbasins 40, 42, and 44, and, to a limited extent, along the natural levees of the Amite and its distributaries. The area is heavily used for recreational purposes and many of the structures in the area are camps, not primary residences. The area does provide residence for river industry employees, and, to a lesser extent, for Baton Rouge workers.

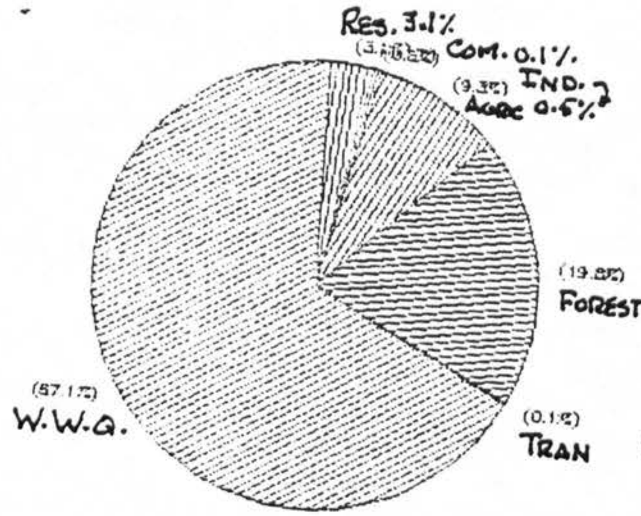
Dispite its large size (21.5% of the study area), this area is projected to receive 7.7% of the study area growth. This will be concentrated in the northern and extreme western portions of the area.

Existing Data and Projections
Land Use in the Lower Basin Region
1978 - 2040

Year	Residential	Commercial	Industrial	Agriculture	Forest	Transition	Water, Wetland, Quarry
1978	5,136	93	907	15,339	32,689	235	111,088
1985	6.845	137	915	15,257	31,595	145	110,596
1990	7,351	149	921	15,072	31,283	17	110,596
2000	8.544	178	933	14.519	30,720	0	110,596
2010	9,629	204	945	14,001	30,115	0	110,596
2020	10,651	229	957	13,519	29,538	0	110,596
2030	11,493	249	969	13,126	29,058	0	110,596
2040	12.367	270	981	12,722	28,555	0	110.596

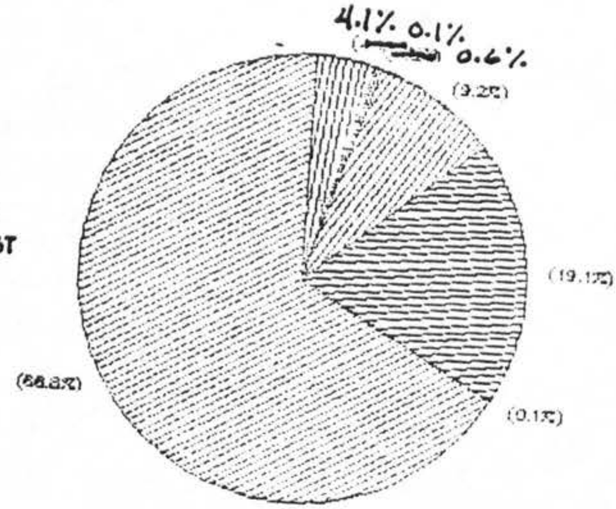
LOWER BASIN

1978



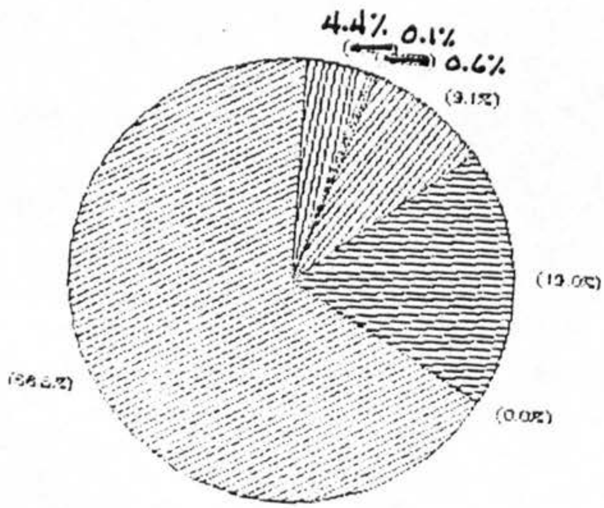
LOWER BASIN

1986



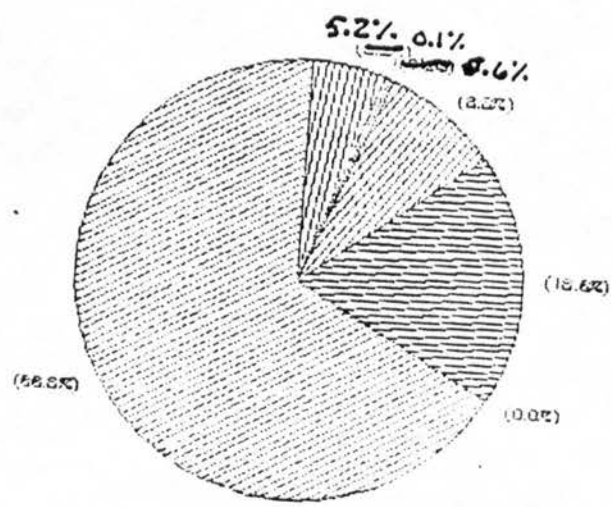
LOWER BASIN

1990



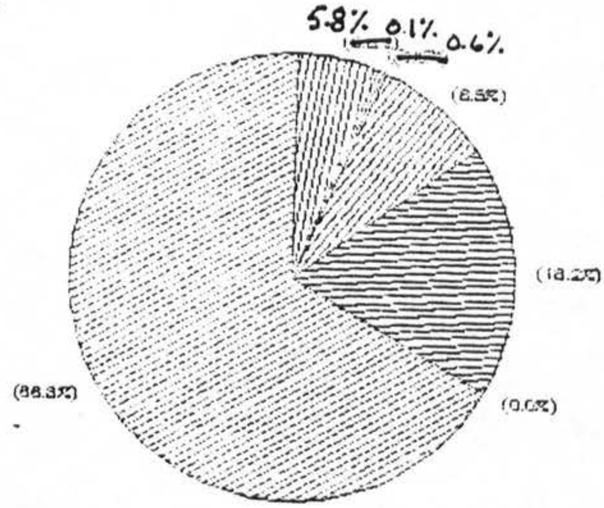
LOWER BASIN

2000



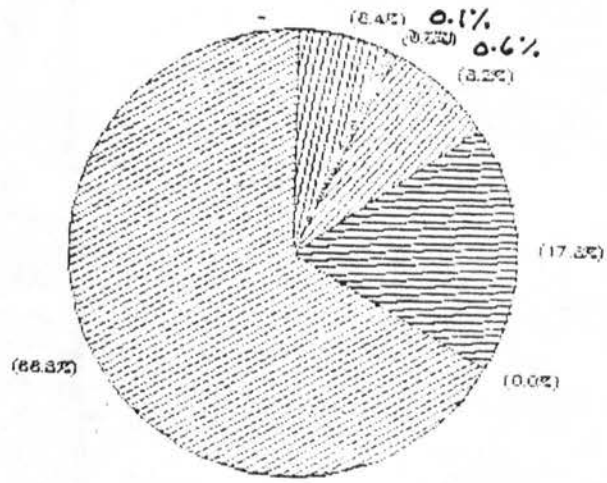
LOWER BASIN

2010



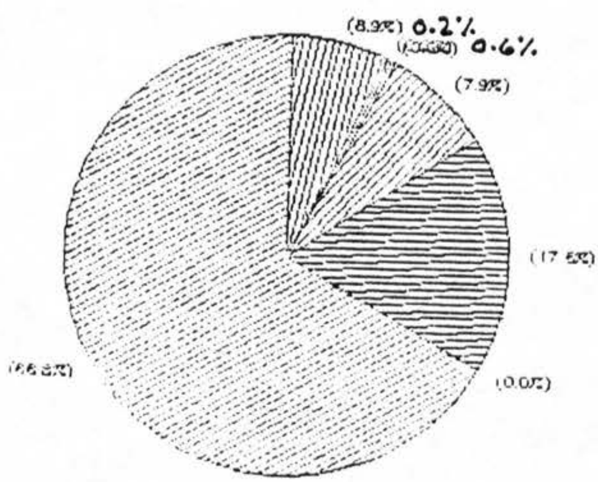
LOWER BASIN

2020



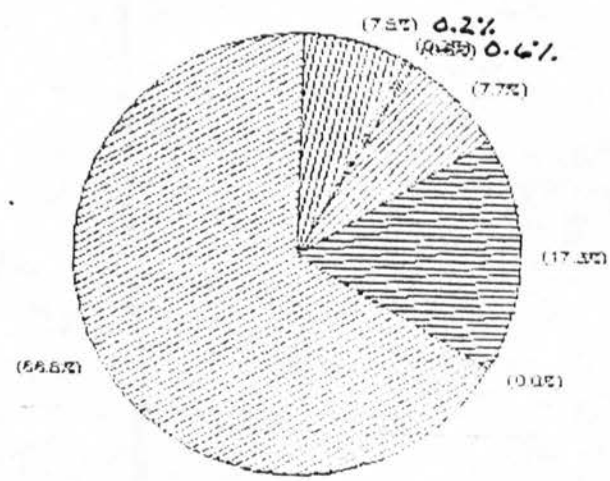
LOWER BASIN

2030



LOWER BASIN

2040



DATA ANALYSIS

The projections created for this study were generated using a Statistical Analysis Systems, Inc. (SAS) package of utilities. The methodology used for the projections was such that only mathematical operations were performed. Programming was conducted by the Louisiana Division of Administration, Office of Information Services.

ACRONYM KEY
FOR LAND USE DATA

BASNO:	Number of the subbasin as provided by Corps.
RESOTH85:	Acreage in residential and "other" urban uses. The digits indicate the year of the data. "Other" category includes parks, an open land in urban areas.
COMMER85:	Acreage in commercial use.
INTCIC85:	Acreage in industrial, transportation, utilities, or industrial/commercial complexes.
DF85:	Deciduous forest acreage.
EF85:	Evergreen forest acreage.
MF85:	Mixed forest acreage.
FWET85:	Forested wetland acreage.
NFWET85:	Non-forested wetland acreage.
QUARRY85:	Gravel pits, sand pits, and areas of topsoil excavation.
TRANS85:	Transitional lands--areas undergoing change at time of survey without clear indication of ultimate use.
AG85:	Agricultural acreage, includes pasture.
WATER85:	All water features.
TOT85:	Total acreage in subbasin.

*NOTE: FWET, NFWET, QUARRY, and WATER were held constant in projections and appear so in these computer printouts.

BASNO	RESOTH85	COMMER85	INTCIC85	DF85	EF85	MF85	FWET85	NFWET85	QUARRY85	TRANS85	AG85	WATER85	TOT85	RESOTH90	COMMER90	INTCIC90	DF90	EF90	MF90	FWET85	NFWET85
01	706	2	198	2830	0	0	0	0	0	0	7675	46	11457	821.21	2.00	198	2820.73	0.000	0.000	0	0
02	1319	300	0	1204	0	21	88	0	0	0	2965	0	5897	1351.66	321.23	0	1199.01	0.000	20.913	88	0
03	2309	159	56	3062	211	944	0	0	0	0	13324	122	20187	2467.56	165.98	56	3057.08	210.661	942.485	0	0
04	399	0	56	2281	318	720	0	41	0	0	7304	0	11119	399.00	0.00	56	2281.00	318.000	720.000	0	41
05	324	0	0	2097	251	341	0	0	0	0	5933	0	8946	324.00	0.00	0	2097.00	251.000	341.000	0	0
06	0	0	74	880	0	0	0	0	0	0	735	28	1717	0.00	0.00	74	880.00	0.000	0.000	0	0
07	526	79	84	2534	122	40	0	0	0	0	1763	0	5148	539.06	80.75	84	2527.03	121.664	39.890	0	0
08	1565	74	0	4583	54	0	0	0	160	42	6779	0	13257	1630.32	82.75	0	4574.99	53.906	0.000	0	0
09	301	163	152	339	0	41	0	0	0	0	1111	0	2107	306.05	163.68	152	338.77	0.000	40.972	0	0

BASNO	QUARRY85	TRANS90	AG90	WATER85	TOT90	RESOTH00	COMMER00	INTCIC00	DF00	EF00	MF00	FWET85	NFWET85	QUARRY85	TRANS00	AG00	WATER85	TOT00
01	0	0.000	7569.1	46	11457	1091.91	2.00	198	2798.40	0.000	0.000	0	0	0	0.0000	7320.7	46	1145
02	0	0.000	2916.2	0	5897	1428.41	371.11	0	1186.99	0.000	20.703	88	0	0	0.0000	2801.8	0	589
03	0	0.000	13165.2	122	20187	2840.12	182.37	56	3045.01	209.829	938.763	0	0	0	0.0000	12792.9	122	2018.
04	0	0.000	7304.0	0	11119	399.00	0.00	56	2281.00	318.000	720.000	0	41	0	0.0000	7304.0	0	1111
05	0	0.000	5933.0	0	8946	324.00	0.00	0	2097.00	251.000	341.000	0	0	0	0.0000	5933.0	0	894
06	0	0.000	735.0	28	1717	0.00	0.00	74	880.00	0.000	0.000	0	0	0	0.0000	735.0	28	171
07	0	0.000	1755.6	0	5148	569.76	84.86	84	2510.64	120.875	39.631	0	0	0	0.0000	1738.2	0	514
08	160	0.000	6755.0	0	13257	1783.81	103.32	0	4531.94	53.398	0.000	0	0	160	0.0000	6624.5	0	1325
09	0	0.000	1105.5	0	2107	317.91	165.27	152	338.21	0.000	40.904	0	0	0	0.0000	1092.7	0	210

BASNO	RESOTH10	COMMER10	INTCIC10	DF10	EF10	MF10	FWET85	NFWET85	QUARRY85	TRANS10	AG10	WATER85	TOT10	RESOTH20	COMMER20	INTCIC20	DF20
01	1337.98	2.00	198	2776.89	0.000	0.000	0	0	0	0.0000	7096.1	46	11457	1570.21	2.00	198	2755.52
02	1498.17	416.46	0	1175.40	0.000	20.501	88	0	0	0.0000	2698.5	0	5897	1564.01	459.26	0	1163.88
03	3178.79	197.27	56	3032.90	208.995	935.030	0	0	0	0.0000	12456.0	122	20187	3498.40	211.33	56	3020.48
04	399.00	0.00	56	2281.00	318.000	720.000	0	41	0	0.0000	7304.0	0	11119	399.00	0.00	56	2281.00
05	324.00	0.00	0	2097.00	251.000	341.000	0	0	0	0.0000	5933.0	0	8946	324.00	0.00	0	2097.00
06	0.00	0.00	74	880.00	0.000	0.000	0	0	0	0.0000	735.0	28	1717	0.00	0.00	74	880.00
07	597.67	88.60	84	2495.71	120.157	39.396	0	0	0	0.0000	1722.5	0	5148	624.00	92.13	84	2481.60
08	1923.34	122.02	0	4492.45	52.933	0.000	0	0	160	0.0000	6506.3	0	13257	2055.02	139.66	0	4454.85
09	328.69	166.71	152	337.68	0.000	40.840	0	0	0	0.0000	1081.1	0	2107	338.86	168.07	152	337.16

BASNO	EF20	MF20	FWET85	NFWET85	QUARRY85	TRANS20	AG20	WATER85	TOT20	RESOTH30	COMMER30	INTIC30	DF30	EF30	MF30	FWET85	NFWET85	QUARRY85
01	0.000	0.000	0	0	0	0.000	6885.3	46	11457	1761.05	2.00	198	2737.12	0.000	0.000	0	0	0
02	0.000	20.300	88	0	0	0.000	2601.6	0	5897	1618.11	494.42	0	1153.95	0.000	20.127	88	0	0
03	208.139	931.201	0	0	0	0.000	12139.4	122	20187	3761.06	222.89	56	3009.49	207.382	927.812	0	0	0
04	318.000	720.000	0	41	0	0.000	7304.0	0	11119	399.00	0.00	56	2281.00	318.000	720.000	0	41	0
05	251.000	341.000	0	0	0	0.000	5933.0	0	8946	324.00	0.00	0	2097.00	251.000	341.000	0	0	0
06	0.000	0.000	0	0	0	0.000	735.0	28	1717	0.00	0.00	74	880.00	0.000	0.000	0	0	0
07	119.477	39.173	0	0	0	0.000	1707.6	0	5148	645.65	95.03	84	2470.00	118.919	38.990	0	0	0
08	52.490	0.000	0	0	160	0.000	6395.0	0	13257	2163.23	154.16	0	4423.71	52.123	0.000	0	0	160
09	0.000	40.778	0	0	0	0.000	1070.1	0	2107	347.23	169.19	152	336.73	0.000	40.725	0	0	0

BASNO	TRANS30	AG30	WATER85	TOT30	RESOTH40	COMMER40	INTIC40	DF40	EF40	MF40	FWET85	NFWET85	QUARRY85	TRANS40	AG40	WATER85	TOT40
01	0.0000	6712.8	46	11457	1959.81	2.00	198	2717.22	0.000	0.000	0	0	0	0.000	6534.0	46	11457
02	0.0000	2522.4	0	5897	1674.46	531.05	0	1143.21	0.000	19.940	88	0	0	0.000	2440.3	0	5897
03	0.0000	11880.4	122	20187	4034.61	234.93	56	2997.37	206.546	924.074	0	0	0	0.000	11611.5	122	20187
04	0.0000	7304.0	0	11119	399.00	0.00	56	2281.00	318.000	720.000	0	41	0	0.000	7304.0	0	11119
05	0.0000	5933.0	0	8946	324.00	0.00	0	2097.00	251.000	341.000	0	0	0	0.000	5933.0	0	8946
06	0.0000	735.0	28	1717	0.00	0.00	74	880.00	0.000	0.000	0	0	0	0.000	735.0	28	1717
07	0.0000	1695.4	0	5148	668.18	98.05	84	2457.89	118.336	38.799	0	0	0	0.000	1682.7	0	5148
08	0.0000	6303.8	0	13257	2275.92	169.26	0	4391.06	51.738	0.000	0	0	160	0.000	6209.0	0	13257
09	0.0000	1061.1	0	2107	355.93	170.36	152	336.26	0.000	40.669	0	0	0	0.000	1051.8	0	2107

BASNO	RESOTH85	COMMER85	INTCIC85	DF85	EF85	MF85	FWET85	NFWET85	QUARRY85	TRANS85	AG85	WATER85	TOT85	RESOTH90	COMMER90	INTCIC90	DF90	EF90	MF90	FWET85
10	3701	369	262	1912	0	0	0	0	87	110	2362	0	8803	3739.90	374.21	262	1912.0	0	0.000	0
11	368	294	1516	634	0	0	384	6	204	0	153	172	3731	368.00	294.00	1516	634.0	0	0.000	384
12	2146	190	0	1368	0	0	0	0	0	99	1051	0	4854	2146.00	190.00	0	1368.0	0	0.000	0
13	2862	20	0	2743	0	0	0	0	0	0	3716	0	9341	2937.72	23.33	0	2722.3	0	0.000	0
14	2648	122	28	1142	0	193	28	0	22	85	3629	30	7927	2747.77	126.39	28	1140.8	0	192.801	28
15	2792	857	3052	313	0	0	0	0	0	0	167	0	7181	2792.00	857.00	3052	313.0	0	0.000	0
16	4698	1184	133	1288	0	0	0	0	54	0	452	0	7809	4744.92	1214.49	133	1241.4	0	0.000	0
17	140	5	0	1305	0	0	0	0	0	83	557	0	2090	140.89	5.04	0	1305.0	0	0.000	0
18	2705	79	138	1824	0	0	0	0	48	0	1027	0	5821	2756.37	85.88	138	1793.6	0	0.000	0

BASNO	NFWET85	QUARRY85	TRANS90	AG90	WATER85	TOT90	RESOTH00	COMMER00	INTCIC00	DF00	EF00	MF00	FWET85	NFWET85	QUARRY85	TRANS00	AG00	WATER85
10	0	87	65.890	2362.0	0	8803	3831.29	386.46	262	1901.5	0	0.000	0	0	87	0.0000	2334.8	0
11	6	204	0.000	153.0	172	3731	368.00	294.00	1516	634.0	0	0.000	384	6	204	0.0000	153.0	172
12	0	0	99.000	1051.0	0	4854	2146.00	190.00	0	1368.0	0	0.000	0	0	0	99.0000	1051.0	0
13	0	0	0.000	3657.7	0	9341	3115.62	31.16	0	2673.3	0	0.000	0	0	0	0.0000	3520.9	0
14	0	22	0.000	3611.2	30	7927	2982.19	136.70	28	1129.3	0	190.848	28	0	22	0.0000	3380.0	30
15	0	0	0.000	167.0	0	7181	2792.00	857.00	3052	313.0	0	0.000	0	0	0	0.0000	167.0	0
16	0	54	0.000	421.1	0	7809	4855.15	1286.15	133	1131.2	0	0.000	0	0	54	0.0000	349.5	0
17	0	0	82.070	557.0	0	2090	142.98	5.13	0	1305.0	0	0.000	0	0	0	79.8849	557.0	0
18	0	48	0.000	999.2	0	5821	2877.07	102.06	138	1721.7	0	0.000	0	0	48	0.0000	934.1	0

BASNO	TOT00	RESOTH10	COMMER10	INTCIC10	DF10	EF10	MF10	FWET85	NFWET85	QUARRY85	TRANS10	AG10	WATER85	TOT10	RESOTH20	COMMER20	INTCIC20
10	8803	3914.37	397.59	262	1876.2	0	0.000	0	0	87	0.0000	2265.8	0	8803	3992.8	408.10	262
11	3731	368.00	294.00	1516	634.0	0	0.000	384	6	204	0.0000	153.0	172	3731	368.0	294.00	1516
12	4854	2146.00	190.00	0	1368.0	0	0.000	0	0	0	99.0000	1051.0	0	4854	2146.0	190.00	0
13	9341	3277.35	38.28	0	2628.0	0	0.000	0	0	0	0.0000	3397.4	0	9341	3430.0	44.99	0
14	7927	3195.28	146.08	28	1116.8	0	188.743	28	0	22	0.0000	3172.1	30	7927	3396.4	154.93	28
15	7181	2792.00	857.00	3052	313.0	0	0.000	0	0	0	0.0000	167.0	0	7181	2792.0	857.00	3052
16	7809	4955.35	1351.28	133	1028.9	0	0.000	0	0	54	0.0000	286.4	0	7809	5049.9	1412.75	133
17	2090	144.89	5.22	0	1305.0	0	0.000	0	0	0	77.8986	557.0	0	2090	146.7	5.29	0
18	5821	2986.78	116.76	138	1655.8	0	0.000	0	0	48	0.0000	875.7	0	5821	3090.3	130.63	138

BASNO	DF20	EF20	MF20	FWET85	NFWET85	QUARRY85	TRANS20	AG20	WATER85	TOT20	RESOTH30	COMMER30	INTCIC30	DF30	EF30	MF30	FWET85	NFWET85
10	1852.0	0	0.000	0	0	87	0.000	2201.1	0	8803	4057.2	416.73	262	1832.0	0	0.000	0	0
11	634.0	0	0.000	384	6	204	0.000	153.0	172	3731	368.0	294.00	1516	634.0	0	0.000	384	6
12	1368.0	0	0.000	0	0	0	99.000	1051.0	0	4854	2146.0	190.00	0	1368.0	0	0.000	0	0
13	2584.5	0	0.000	0	0	0	0.000	3281.5	0	9341	3555.4	50.51	0	2548.3	0	0.000	0	0
14	1103.3	0	186.464	28	0	22	0.000	2977.9	30	7927	3561.7	162.20	28	1090.8	0	184.353	28	0
15	313.0	0	0.000	0	0	0	0.000	167.0	0	7181	2792.0	857.00	3052	313.0	0	0.000	0	0
16	930.4	0	0.000	0	0	54	0.000	228.9	0	7809	5127.6	1463.26	133	847.6	0	0.000	0	0
17	1305.0	0	0.000	0	0	0	76.024	557.0	0	2090	148.2	5.36	0	1305.0	0	0.000	0	0
18	1593.0	0	0.000	0	0	48	0.000	821.0	0	5821	3175.4	142.04	138	1540.9	0	0.000	0	0

BASNO	QUARRY85	TRANS30	AG30	WATER85	TOT30	RESOTH40	COMMER40	INTCIC40	DF40	EF40	MF40	FWET85	NFWET85	QUARRY85	TRANS40	AG40	WATER85	TOT40
10	87	0.0000	2148.1	0	8803	4124.3	425.73	262	1810.8	0	0.000	0	0	87	0.000	2093.1	0	8803
11	204	0.0000	153.0	172	3731	368.0	294.00	1516	634.0	0	0.000	384	6	204	0.000	153.0	172	3731
12	0	99.0000	1051.0	0	4854	2146.0	190.00	0	1368.0	0	0.000	0	0	0	99.000	1051.0	0	4854
13	0	0.0000	3186.8	0	9341	3686.0	56.26	0	2510.1	0	0.000	0	0	0	0.000	3088.6	0	9341
14	22	0.0000	2820.0	30	7927	3733.8	169.77	28	1076.6	0	181.943	28	0	22	0.000	2656.9	30	7927
15	0	0.0000	167.0	0	7181	2792.0	857.00	3052	313.0	0	0.000	0	0	0	0.000	167.0	0	7181
16	54	0.0000	183.5	0	7809	5208.6	1515.87	133	759.6	0	0.000	0	0	54	0.000	138.0	0	7809
17	0	74.4834	557.0	0	2090	149.7	5.43	0	1305.0	0	0.000	0	0	0	72.879	557.0	0	2090
18	48	0.0000	776.6	0	5821	3264.0	153.91	138	1486.2	0	0.000	0	0	48	0.000	730.8	0	5821

BASNO	RESOTH85	COMMER85	INTCIC85	DF85	EF85	MF85	FWET85	NFWET85	QUARRY85	TRANS85	AG85	WATER85	TOT85	RESOTH90	COMMER90	INTCIC90	DF90	EF90	MF90	FWET85
19	1939	71	0	3296	0	77	252	0	5	55	1237	0	6932	1979.68	76.45	0	3296.0	0	77.000	252
20	597	620	1225	0	0	0	0	0	36	0	0	69	2547	597.00	620.00	1225	0.0	0	0.000	0
21	2988	1504	361	896	0	0	0	0	21	0	704	0	6474	3088.36	1569.24	361	839.1	0	0.000	0
22	5679	2218	375	1528	0	175	0	0	0	30	725	0	10730	6179.92	2543.60	375	1134.2	0	129.900	0
23	777	327	16	30	0	0	0	0	0	0	0	0	1150	777.00	327.00	16	30.0	0	0.000	0
24	1432	488	49	793	0	0	0	0	0	200	143	0	3105	1483.07	521.20	49	793.0	0	0.000	0
25	3151	580	185	460	0	0	0	0	2	0	91	302	4771	3238.89	676.68	185	339.4	0	0.000	0
26	1791	733	150	91	0	0	0	0	0	0	140	0	2905	1791.00	733.00	150	91.0	0	0.000	0
27	3298	1187	213	109	0	0	0	0	0	19	18	0	4844	3298.00	1187.00	213	109.0	0	0.000	0

BASNO	NFWET85	QUARRY85	TRANS90	AG90	WATER85	TOT90	RESOTH00	COMMER00	INTCIC00	DF00	EF00	MF00	FWET85	NFWET85	QUARRY85	TRANS00	AG00	WATER85
19	0	5	8.869	1237.0	0	6932	2075.26	89.26	0	3232.3	0	75.511	252	0	5	0.000	1202.7	0
20	0	36	0.000	0.0	69	2547	597.00	620.00	1225	0.0	0	0.000	0	0	36	0.000	0.0	69
21	0	21	0.000	595.3	0	6474	3324.18	1722.51	361	698.2	0	0.000	0	0	21	0.000	347.1	0
22	0	0	0.000	367.4	0	10730	6843.55	2974.95	375	481.4	0	55.131	0	0	0	0.000	0.0	0
23	0	0	0.000	0.0	0	1150	777.00	327.00	16	30.0	0	0.000	0	0	0	0.000	0.0	0
24	0	0	115.731	143.0	0	3105	1603.07	599.20	49	726.3	0	0.000	0	0	0	0.000	127.4	0
25	0	2	0.000	27.0	302	4771	3299.79	743.66	185	238.6	0	0.000	0	0	2	0.000	0.0	302
26	0	0	0.000	140.0	0	2905	1791.00	733.00	150	91.0	0	0.000	0	0	0	0.000	140.0	0
27	0	0	19.000	18.0	0	4844	3298.00	1187.00	213	109.0	0	0.000	0	0	0	19.000	18.0	0

BASNO	TOT00	RESOTH10	COMMER10	INTCIC10	DF10	EF10	MF10	FWET85	NFWET85	QUARRY85	TRANS10	AG10	WATER85	TOT10	RESOTH20	COMMER20	INTCIC20
19	6932	2162.15	100.90	0	3169.1	0	74.035	252	0	5	0.0000	1168.8	0	6932	2244.1	111.89	0
20	2547	597.00	620.00	1225	0.0	0	0.000	0	0	36	0.0000	0.0	69	2547	597.0	620.00	1225
21	6474	3538.54	1861.85	361	547.0	0	0.000	0	0	21	0.0000	144.7	0	6474	3740.8	1993.35	361
22	10730	6843.55	2974.95	375	481.4	0	55.131	0	0	0	0.0000	0.0	0	10730	6843.5	2974.95	375
23	1150	777.00	327.00	16	30.0	0	0.000	0	0	0	0.0000	0.0	0	1150	777.0	327.00	16
24	3105	1712.16	670.10	49	585.4	0	0.000	0	0	0	0.0000	88.3	0	3105	1815.1	737.02	49
25	4771	3299.79	743.66	185	238.6	0	0.000	0	0	2	0.0000	0.0	302	4771	3299.8	743.66	185
26	2905	1791.00	733.00	150	91.0	0	0.000	0	0	0	0.0000	140.0	0	2905	1791.0	733.00	150
27	4844	3298.00	1187.00	213	109.0	0	0.000	0	0	0	19.0000	18.0	0	4844	3298.0	1187.00	213

BASNO	DF20	EF20	MF20	FWET85	NFWET85	QUARRY85	TRANS20	AG20	WATER85	TOT20	RESOTH30	COMMER30	INTCIC30	DF30	EF30	MF30	FWET85	NFWET85
19	3109.3	0	72.638	252	0	5	0.0000	1137.0	0	6932	2311.5	120.92	0	3060.1	0	71.488	252	0
20	0.0	0	0.000	0	0	36	0.0000	0.0	69	2547	597.0	620.00	1225	0.0	0	0.000	0	0
21	357.8	0	0.000	0	0	21	0.0000	0.0	0	6474	3761.5	2006.78	361	323.7	0	0.000	0	0
22	481.4	0	55.131	0	0	0	0.0000	0.0	0	10730	6843.5	2974.95	375	481.4	0	55.131	0	0
23	30.0	0	0.000	0	0	0	0.0000	0.0	0	1150	777.0	327.00	16	30.0	0	0.000	0	0
24	450.0	0	0.000	0	0	0	0.0000	53.9	0	3105	1899.7	792.01	49	336.1	0	0.000	0	0
25	238.6	0	0.000	0	0	2	0.0000	0.0	302	4771	3299.8	743.66	185	238.6	0	0.000	0	0
26	91.0	0	0.000	0	0	0	0.0000	140.0	0	2905	1791.0	733.00	150	91.0	0	0.000	0	0
27	109.0	0	0.000	0	0	0	19.0000	18.0	0	4844	3298.0	1187.00	213	109.0	0	0.000	0	0

BASNO	QUARRY85	TRANS30	AG30	WATER85	TOT30	RESOTH40	COMMER40	INTCIC40	DF40	EF40	MF40	FWET85	NFWET85	QUARRY85	TRANS40	AG40	WATER85	TOT40
19	5	0	1111.0	0	6932	2381.7	130.32	0	3008.7	0	70.288	252	0	5	0	1084.0	0	6932
20	36	0	0.0	69	2547	597.0	620.00	1225	0.0	0	0.000	0	0	36	0	0.0	69	2547
21	21	0	0.0	0	6474	3761.5	2006.78	361	323.7	0	0.000	0	0	21	0	0.0	0	6474
22	0	0	0.0	0	10730	6843.5	2974.95	375	481.4	0	55.131	0	0	0	0	0.0	0	10730
23	0	0	0.0	0	1150	777.0	327.00	16	30.0	0	0.000	0	0	0	0	0.0	0	1150
24	0	0	28.2	0	3105	1987.8	849.28	49	214.0	0	0.000	0	0	0	0	4.9	0	3105
25	2	0	0.0	302	4771	3299.8	743.66	185	238.6	0	0.000	0	0	2	0	0.0	302	4771
26	0	0	140.0	0	2905	1791.0	733.00	150	91.0	0	0.000	0	0	0	0	140.0	0	2905
27	0	19	18.0	0	4844	3298.0	1187.00	213	109.0	0	0.000	0	0	0	19	18.0	0	4844

BASNO	RESOTH85	COMMER85	INTCIC85	DF85	EF85	MF85	FWET85	NFWET85	QUARRY85	TRANS85	AG85	WATER85	TOT85	RESOTH90	COMMER90	INTCIC90	DF90	EF90	MF90
28	1088	385	129	61	0	0	0	0	0	48	107	11	1829	1147.3	450.240	129	61.0	0.0	0.0
29	5546	680	194	3881	0	0	3869	0	0	390	11195	53	25808	6230.1	771.673	194	3857.8	0.0	0.0
30	1172	373	40	207	0	0	0	0	0	0	415	0	2207	1220.4	404.460	40	204.2	0.0	0.0
31	3801	630	501	1701	0	726	90	0	14	49	2122	0	9634	4238.7	914.490	501	1518.6	0.0	648.2
32	1626	130	726	1848	0	0	0	0	90	335	2298	24	7077	1759.3	216.659	726	1848.0	0.0	0.0
33	1169	442	1572	11512	0	0	2499	872	0	0	14148	156	32370	1266.7	455.090	1572	11478.8	0.0	0.0
34	1312	56	1478	5809	0	90	2553	133	0	0	5860	19	17310	1462.0	62.598	1478	5753.5	0.0	89.1
35	823	261	70	780	0	0	0	0	0	0	1996	11	3941	841.1	272.773	70	777.6	0.0	0.0
36	1151	263	0	522	0	0	1	0	0	0	1053	0	2990	1178.0	280.563	0	516.6	0.0	0.0

BASNO	FWET85	NFWET85	QUARRY85	TRANS90	AG90	WATER85	TOT90	RESOTH00	COMMER00	INTCIC00	DF00	EF00	MF00	FWET85	NFWET85	QUARRY85	TRANS00	AG00
28	0	0	0	0.000	30.4	11	1829	1147.3	450.24	129	61.0	0.0	0.0	0	0	0	0.000	30.4
29	3869	0	0	0.000	10832.4	53	25808	7837.6	987.07	194	3788.5	0.0	0.0	3869	0	0	0.000	9078.9
30	0	0	0	0.000	337.9	0	2207	1334.1	478.38	40	191.3	0.0	0.0	0	0	0	0.000	163.2
31	90	0	14	0.000	1709.0	0	9634	5267.0	1582.93	501	1042.0	0.0	444.7	90	0	14	0.000	692.3
32	0	0	90	115.019	2298.0	24	7077	2072.6	420.28	726	1727.4	0.0	0.0	0	0	90	0.000	2016.7
33	2499	872	0	0.000	14070.4	156	32370	1496.2	485.85	1572	11400.6	0.0	0.0	2499	872	0	0.000	13888.3
34	2553	133	0	0.000	5759.8	19	17310	1814.3	78.10	1478	5622.5	0.0	87.1	2553	133	0	0.000	5525.0
35	0	0	0	0.000	1968.5	11	3941	883.7	300.44	70	771.9	0.0	0.0	0	0	0	0.000	1903.9
36	1	0	0	0.000	1013.8	0	2990	1241.5	321.83	0	503.4	0.0	0.0	1	0	0	0.000	922.3

BASNO	WATER85	TOT00	RESOTH10	COMMER10	INTCIC10	DF10	EF10	MF10	FWET85	NFWET85	QUARRY85	TRANS10	AG10	WATER85	TOT10	RESOTH20	COMMER20
28	11	1829	1147.3	450.24	129	61.0	0.0	0.0	0	0	0	0.0000	30.4	11	1829	1147.3	450.24
29	53	25808	9298.8	1182.87	194	3677.8	0.0	0.0	3869	0	0	0.0000	7532.5	53	25808	10677.8	1367.66
30	0	2207	1437.5	545.57	40	156.4	0.0	0.0	0	0	0	0.0000	27.5	0	2207	1482.1	574.56
31	0	9634	6201.9	2190.57	501	446.1	0.0	190.4	90	0	14	0.0000	0.0	0	9634	6295.7	2251.57
32	24	7077	2357.3	605.37	726	1590.1	0.0	0.0	0	0	90	0.0000	1684.1	24	7077	2626.1	780.05
33	156	32370	1704.9	513.81	1572	11329.2	0.0	0.0	2499	872	0	0.0000	13723.1	156	32370	1901.8	540.19
34	19	17310	2134.6	92.19	1478	5502.0	0.0	85.2	2553	133	0	0.0000	5313.0	19	17310	2436.8	105.49
35	11	3941	922.4	325.58	70	766.5	0.0	0.0	0	0	0	0.0000	1845.6	11	3941	958.9	349.31
36	0	2990	1299.2	359.34	0	490.0	0.0	0.0	1	0	0	0.0000	840.4	0	2990	1353.7	394.75

BASNO	INTCIC20	DF20	EF20	MF20	FWET85	NFWET85	QUARRY85	TRANS20	AG20	WATER85	TOT20	RESOTH30	COMMER30	INTCIC30	DF30	EF30	MF30
28	129	61.0	0.0	0.0	0	0	0	0.0000	30.4	11	1829	1147.3	450.24	129	61.0	0.0	0.0
29	194	3527.1	0.0	0.0	3869	0	0	0.0000	6119.4	53	25808	11811.1	1519.52	194	3361.9	0.0	0.0
30	40	110.4	0.0	0.0	0	0	0	0.0000	0.0	0	2207	1482.1	574.56	40	110.4	0.0	0.0
31	501	337.6	0.0	144.1	90	0	14	0.0000	0.0	0	9634	6295.7	2251.57	501	337.6	0.0	144.1
32	726	1451.0	0.0	0.0	0	0	90	0.0000	1379.8	24	7077	2846.9	923.60	726	1328.2	0.0	0.0
33	1572	11261.5	0.0	0.0	2499	872	0	0.0000	13567.5	156	32370	2063.6	561.88	1572	11205.7	0.0	0.0
34	1478	5387.1	0.0	83.5	2553	133	0	0.0000	5114.1	19	17310	2685.2	116.42	1478	5291.6	0.0	82.0
35	70	761.0	0.0	0.0	0	0	0	0.0000	1790.8	11	3941	988.9	368.82	70	756.3	0.0	0.0
36	0	476.3	0.0	0.0	1	0	0	0.0000	764.3	0	2990	1398.4	423.84	0	464.0	0.0	0.0

BASNO	FWET85	NFWET85	QUARRY85	TRANS30	AG30	WATER85	TOT30	RESOTH40	COMMER40	INTCIC40	DF40	EF40	MF40	FWET85	NFWET85	QUARRY85	TRANS40	AG40	WATER85	TOT40
28	0	0	0	0	30.4	11	1829	1147.3	450.24	129	61.0	0.0	0.0	0	0	0	0	30.4	11	1829
29	3869	0	0	0	4999.5	53	25808	12991.3	1677.67	194	3149.6	0.0	0.0	3869	0	0	0	3873.4	53	25808
30	0	0	0	0	0.0	0	2207	1482.1	574.56	40	110.4	0.0	0.0	0	0	0	0	0.0	0	2207
31	90	0	14	0	0.0	0	9634	6295.7	2251.57	501	337.6	0.0	144.1	90	0	14	0	0.0	0	9634
32	0	0	90	0	1138.3	24	7077	3076.9	1073.10	726	1192.0	0.0	0.0	0	0	90	0	895.0	24	7077
33	2499	872	0	0	13439.8	156	32370	2232.2	584.46	1572	11147.3	0.0	0.0	2499	872	0	0	13307.1	156	32370
34	2553	133	0	0	4951.8	19	17310	2943.9	127.80	1478	5191.3	0.0	80.4	2553	133	0	0	4783.5	19	17310
35	0	0	0	0	1746.0	11	3941	1020.1	389.13	70	751.2	0.0	0.0	0	0	0	0	1699.5	11	3941
36	1	0	0	0	702.7	0	2990	1445.1	454.14	0	450.3	0.0	0.0	1	0	0	0	639.5	0	2990

BASNO	RESOTH85	COMMER85	INTCIC85	DF85	EF85	MF85	FHET85	NFHET85	QUARRY85	TRANS85	AG85	WATER85	TOT85	RESOTH90	COMMER90	INTCIC90	DF90	EF90	MF90	FHET85
37	1705	376	1203	4424	0	0	301	0	0	0	4784	49	12842	1827.9	455.904	1203	4356.0	0.0	0.0	301
38	1048	233	786	6848	0	0	940	0	61	287	9391	91	19685	1070.0	247.282	786	6848.0	0.0	0.0	940
39	817	180	200	875	0	0	0	0	0	0	1413	0	3485	828.6	187.527	200	871.1	0.0	0.0	0
40	877	32	171	1517	0	0	6733	0	0	54	4078	54	13516	908.2	32.000	171	1517.0	0.0	0.0	6733
41	2309	128	11	1334	0	12	0	0	0	0	3509	0	7303	2525.5	137.524	11	1318.3	0.0	11.9	0
42	364	0	0	1688	0	0	2609	0	0	0	1694	133	6488	364.3	0.000	0	1687.9	0.0	0.0	2609
43	1522	12	28	320	0	479	0	0	0	0	1788	0	4149	1713.2	37.624	28	310.8	0.0	465.2	0
44	2693	72	0	2170	544	3211	2806	0	0	0	4085	585	16166	2970.3	84.203	0	2120.0	531.5	3137.0	2806
45	13093	699	1063	42	53926	38158	2632	35	33	690	12571	189	123131	14147.1	745.381	1063	41.8	53721.9	38013.6	2632

BASNO	NFHET85	QUARRY85	TRANS90	AG90	WATER85	TOT90	RESOTH00	COMMER00	INTCIC00	DF00	EF00	MF00	FHET85	NFHET85	QUARRY85	TRANS00	AG00	WATER85
37	0	0	0.000	4649.2	49	12842	2116.8	643.648	1203	4194.7	0.0	0.0	301	0	0	0.000	4333.9	49
38	0	61	250.745	9391.0	91	19685	1121.6	280.841	786	6848.0	0.0	0.0	940	0	61	165.559	9391.0	91
39	0	0	0.000	1397.8	0	3485	855.8	205.213	200	861.8	0.0	0.0	0	0	0	0.000	1362.1	0
40	0	0	22.822	4078.0	54	13516	981.4	32.000	171	1516.1	0.0	0.0	6733	0	0	0.000	4028.5	54
41	0	0	0.000	3298.8	0	7303	3034.1	159.903	11	1276.6	0.0	11.5	0	0	0	0.000	2810.0	0
42	0	0	0.000	1693.8	133	6488	365.0	0.000	0	1687.7	0.0	0.0	2609	0	0	0.000	1693.3	133
43	0	0	0.000	1594.1	0	4149	2162.5	97.830	28	285.7	0.0	427.7	0	0	0	0.000	1147.2	0
44	0	0	0.000	3932.0	585	16166	3622.0	112.874	0	2001.6	501.8	2961.9	2806	0	0	0.000	3574.9	585
45	35	33	0.000	12509.1	189	123131	16623.8	854.357	1063	40.8	52438.0	37105.1	2632	35	33	0.000	12116.9	189

BASNO	TOT00	RESOTH10	COMMER10	INTCIC10	DF10	EF10	MF10	FHET85	NFHET85	QUARRY85	TRANS10	AG10	WATER85	TOT10	RESOTH20	COMMER20	INTCIC20
37	12842	2379.3	814.314	1203	4044.8	0.0	0.0	301	0	0	0.0000	4050.6	49	12842	2627.1	975.38	1203
38	19685	1168.5	311.346	786	6848.0	0.0	0.0	940	0	61	88.1219	9391.0	91	19685	1212.8	340.14	786
39	3485	880.5	221.290	200	853.3	0.0	0.0	0	0	0	0.0000	1329.9	0	3485	903.9	236.46	200
40	13516	1048.0	32.000	171	1515.1	0.0	0.0	6733	0	0	0.0000	3962.9	54	13516	1110.9	32.00	171
41	7303	3496.4	180.246	11	1226.7	0.0	11.0	0	0	0	0.0000	2377.6	0	7303	3932.7	199.44	11
42	6488	365.6	0.000	0	1687.4	0.0	0.0	2609	0	0	0.0000	1692.9	133	6488	366.2	0.00	0
43	4149	2571.0	152.560	28	253.4	0.0	379.3	0	0	0	0.0000	764.7	0	4149	2956.4	204.21	28
44	16166	4214.3	138.938	0	1892.2	474.4	2799.9	2806	0	0	0.0000	3255.3	585	16166	4773.3	163.53	0
45	123131	18875.3	953.421	1063	39.9	51269.8	36278.4	2632	35	33	0.0000	11762.1	189	123131	21000.1	1046.91	1063

BASNO	DF20	EF20	MF20	FWET85	NFWET85	QUARRY85	TRANS20	AG20	WATER85	TOT20	RESOTH30	COMMER30	INTIC30	DF30	EF30	MF30	FWET85
37	3900.3	0.0	0.0	301	0	0	0.0000	3786.2	49	12842	2830.8	1107.74	1203	3779.2	0.0	0.0	301
38	6848.0	0.0	0.0	940	0	61	15.0412	9391.0	91	19685	1249.2	363.79	786	6835.9	0.0	0.0	940
39	845.1	0.0	0.0	0	0	0	0.0000	1299.5	0	3485	923.0	248.93	200	838.3	0.0	0.0	0
40	1513.9	0.0	0.0	6733	0	0	0.0000	3901.2	54	13516	1162.5	32.00	171	1512.9	0.0	0.0	6733
41	1168.3	0.0	10.5	0	0	0	0.0000	1981.0	0	7303	4291.3	215.22	11	1110.2	0.0	10.0	0
42	1687.2	0.0	0.0	2609	0	0	0.0000	1692.5	133	6488	366.7	0.00	0	1687.1	0.0	0.0	2609
43	212.2	0.0	317.7	0	0	0	0.0000	430.5	0	4149	3273.2	246.66	28	166.2	0.0	248.8	0
44	1787.2	448.0	2644.6	2806	0	0	0.0000	2958.3	585	16166	5232.7	183.75	0	1699.5	426.1	2514.8	2806
45	39.1	50166.3	35497.6	2632	35	33	0.0000	11429.0	189	123131	22746.2	1123.74	1063	38.4	49258.8	34855.5	2632

BASNO	NFWET85	QUARRY85	TRANS30	AG30	WATER85	TOT30	RESOTH40	COMMER40	INTIC40	DF40	EF40	MF40	FWET85	NFWET85	QUARRY85	TRANS40	AG40	WATER85	TOT40
37	0	0	0	3571.3	49	12842	3042.8	1245.59	1203	3651.0	0.0	0.0	301	0	0	0	3349.6	49	12842
38	0	61	0	9358.1	91	19685	1287.1	388.43	786	6819.2	0.0	0.0	940	0	61	0	9312.3	91	19685
39	0	0	0	1274.7	0	3485	943.0	261.92	200	831.2	0.0	0.0	0	0	0	0	1248.9	0	3485
40	0	0	0	3850.6	54	13516	1216.3	32.00	171	1511.7	0.0	0.0	6733	0	0	0	3798.0	54	13516
41	0	0	0	1665.3	0	7303	4664.7	231.65	11	1040.2	0.0	9.4	0	0	0	0	1346.1	0	7303
42	0	0	0	1692.2	133	6488	367.2	0.00	0	1686.9	0.0	0.0	2609	0	0	0	1691.9	133	6488
43	0	0	0	186.1	0	4149	3603.1	290.86	28	90.9	0.0	136.1	0	0	0	0	0.0	0	4149
44	0	0	0	2718.1	585	16166	5711.2	204.80	0	1606.9	402.8	2377.8	2806	0	0	0	2471.5	585	16166
45	35	33	0	11156.5	189	123131	24564.7	1203.76	1063	37.6	48313.0	34186.2	2632	35	33	0	10873.7	189	123131

BASNO	RESOTH85	COMMER85	INTCIC85	DF85	EF85	MF85	FHET85	NFHET85	QUARRY85	TRANS85	AG85	WATER85	TOT85	RESOTH90	COMMER90	INTCIC90	DF90
46	2292	149	109	861	2814	4345	801	0	0	120	3942	120	15553	2416.71	154.487	109	860.4
47	1660	33	122	1756	0	4413	439	0	329	133	1244	0	10129	1800.45	51.820	122	1750.1
48	600	33	132	1023	0	0	0	0	0	0	143	0	1931	643.65	61.372	132	962.4
49	660	183	184	240	165	276	0	0	0	0	300	0	2008	681.38	196.896	184	232.6
50	1053	187	92	117	636	47	0	0	0	0	619	15	2766	1078.54	203.598	92	114.4
51	2459	311	0	276	305	1223	0	0	58	0	623	36	5291	2533.83	321.027	0	267.5
52	1821	0	0	0	0	2608	0	0	78	0	1492	0	5999	1919.88	0.000	0	0.0
53	1531	169	38	3818	12403	15110	1576	0	12	0	20492	0	55149	1603.45	172.188	38	3813.4 1
54	1635	41	43	1315	7	2391	0	0	358	0	1358	0	7148	1675.98	41.000	43	1305.5

BASNO	FHET85	NFHET85	QUARRY85	TRANS90	AG90	WATER85	TOT90	RESOTH00	COMMER00	INTCIC00	DF00	EF00	MF00	FHET85	NFHET85	QUARRY85
46	801	0	0	0	3937.8	120	15553	2709.73	167.380	109	841.3	2749.6	4245.5	801	0	0
47	439	0	329	0	1238.5	0	10129	2130.45	96.040	122	1666.4	0.0	4187.8	439	0	329
48	0	0	0	0	131.5	0	1931	746.21	128.035	132	819.8	0.0	0.0	0	0	0
49	0	0	0	0	285.7	0	2008	731.61	229.548	184	215.1	147.9	247.4	0	0	0
50	0	0	0	0	594.8	15	2766	1138.54	242.598	92	108.2	588.0	43.5	0	0	0
51	0	0	58	0	593.9	36	5291	2709.64	344.586	0	247.3	273.3	1096.0	0	0	58
52	0	0	78	0	1445.8	0	5999	2152.20	0.000	0	0.0	0.0	2431.0	0	0	78
53	1576	0	12	0	20454.4	0	55149	1773.68	179.678	38	3802.5	12352.5	15048.5	1576	0	12
54	0	0	358	0	1344.0	0	7148	1772.26	41.000	43	1283.0	6.8	2332.9	0	0	358

BASNO	TOT10	RESOTH10	COMMER10	INTCIC10	DF10	EF10	MF10	FHET85	NFHET85	QUARRY85	TRANS10	AG10	WATER85
46	15553	2976.10	179.100	109	823.9	2692.7	4157.7	801	0	0	0	3693.5	120
47	10129	2430.43	136.237	122	1590.1	0.0	3996.0	439	0	329	0	1086.2	0
48	1931	839.44	188.633	132	689.2	0.0	0.0	0	0	0	0	81.8	0
49	2008	777.27	259.228	184	199.1	136.8	228.9	0	0	0	0	222.7	0
50	2766	1193.08	278.051	92	102.4	556.7	41.1	0	0	0	0	487.6	15
51	5291	2869.46	366.002	0	228.9	252.9	1014.1	0	0	58	0	465.7	36
52	5999	2363.39	0.000	0	0.0	0.0	2316.7	0	0	78	0	1240.9	0
53	55149	1928.43	186.487	38	3792.6	12320.3	15009.3	1576	0	12	0	20285.9	0
54	7148	1859.78	41.000	43	1262.6	6.7	2295.7	0	0	358	0	1281.2	0

BASNO	RESOTH85	COMMER85	INTCIC85	DF85	EF85	MF85	FWET85	NFWET85	QUARRY85	TRANS85	AG85	WATER85	TOT85	RESOTH90	COMMER90	INTCIC90	DF90	EF90	MF90	FWET85
55	623	77	0	0	812	4839	67	0	1478	0	3381	0	11277	648.54	77.0000	0	0.0	810.07	4827.52	67
56	133	0	0	0	1006	3780	0	0	3671	17	2202	178	10987	133.00	0.0000	0	0.0	1006.00	3780.00	0
57	36	38	158	0	4158	1692	0	0	94	0	348	0	6524	36.00	38.0000	158	0.0	4158.00	1692.00	0
58	2	0	0	0	1656	3883	376	0	1809	30	1681	0	9437	2.00	0.0000	0	0.0	1656.00	3883.00	376
59	2911	33	744	13509	8024	932	95049	759	0	91	5400	1868	129320	3109.65	33.0000	744	13463.6	7997.05	928.87	95049
60	2309	27	289	637	143	1276	1	0	32	377	2418	39	7548	2811.11	94.2828	289	615.7	138.23	1233.40	1

BASNO	NFWET85	QUARRY85	TRANS90	AG90	WATER85	TOT90	RESOTH00	COMMER00	INTCIC00	DF00	EF00	MF00	FWET85	NFWET85	QUARRY85	TRANS00	AG00	WATER85	TOT00
55	0	1478	0	3368.87	0	11277	708.54	77.000	0	0.0	805.55	4800.54	67	0	1478	0	3340.38	0	11277
56	0	3671	17	2202.00	178	10987	133.00	0.000	0	0.0	1006.00	3780.00	0	0	3671	17	2202.00	178	10987
57	0	94	0	348.00	0	6524	36.00	38.000	158	0.0	4158.00	1692.00	0	0	94	0	348.00	0	6524
58	0	1809	30	1681.00	0	9437	2.00	0.000	0	0.0	1656.00	3883.00	376	0	1809	30	1681.00	0	9437
59	759	0	0	5367.81	1868	129320	3576.39	33.000	744	13267.2	7880.35	915.32	95049	759	0	0	5227.78	1868	129320
60	0	32	0	2294.25	39	7548	3990.88	252.372	289	491.1	110.24	983.71	1	0	32	0	1358.71	39	7548

BASNO	RESOTH10	COMMER10	INTCIC10	DF10	EF10	MF10	FWET85	NFWET85	QUARRY85	TRANS10	AG10	WATER85	TOT10	RESOTH20	COMMER20	INTCIC20	DF20
55	763.08	77.000	0	0.0	801.43	4775.98	67	0	1478	0	3314.51	0	11277	814.55	77.000	0	0.0
56	133.00	0.000	0	0.0	1006.00	3780.00	0	0	3671	17	2202.00	178	10987	133.00	0.000	0	0.0
57	36.00	38.000	158	0.0	4158.00	1692.00	0	0	94	0	348.00	0	6524	36.00	38.000	158	0.0
58	2.00	0.000	0	0.0	1656.00	3883.00	376	0	1809	30	1681.00	0	9437	2.00	0.000	0	0.0
59	4000.68	33.000	744	13088.2	7774.08	902.97	95049	759	0	0	5101.03	1868	129320	4401.09	33.000	744	12919.1
60	5063.32	396.079	289	351.7	78.95	704.47	1	0	32	0	592.50	39	7548	6075.44	531.703	289	179.7

BASNO	DF20	EF20	MF20	FWET85	NFWET85	QUARRY85	TRANS20	AG20	WATER85	TOT20	RESOTH30	COMMER30	INTCIC30	DF30	EF30	MF30	FWET85
46	807.4	2638.8	4074.5	801	0	0	0	3584.6	120	15553	3434.07	199.251	109	793.8	2594.4	4006.0	801
47	1517.8	0.0	3814.5	439	0	329	0	1018.9	0	10129	2946.19	205.349	122	1458.3	0.0	3664.9	439
48	564.9	0.0	0.0	0	0	0	0	60.8	0	1931	999.72	292.820	132	461.9	0.0	0.0	0
49	183.7	126.3	211.2	0	0	0	0	195.3	0	2008	855.78	310.259	184	170.8	117.4	196.5	0
50	96.9	526.5	38.9	0	0	0	0	440.7	15	2766	1286.85	339.004	92	92.2	501.2	37.0	0
51	211.2	233.4	936.0	0	0	58	0	409.8	36	5291	3144.24	402.822	0	196.6	217.3	871.2	0
52	0.0	0.0	2207.8	0	0	78	0	1150.5	0	5999	2726.50	0.000	0	0.0	0.0	2117.3	0
53	3783.2	12289.9	14972.3	1576	0	12	0	20210.2	0	55149	2194.49	198.193	38	3775.5	12264.9	14941.8	1576
54	1243.3	6.6	2260.6	0	0	358	0	1253.1	0	7148	2010.25	41.000	43	1227.4	6.5	2231.7	0

BASNO	NFWET85	QUARRY85	TRANS30	AG30	WATER85	TOT30	RESOTH40	COMMER40	INTCIC40	DF40	EF40	MF40	FWET85	NFWET85	QUARRY85	TRANS40	AG40	WATER85	TOT40
46	0	0	0	3495.5	120	15553	3649.22	208.718	109	779.6	2548.0	3934.3	801	0	0	0	3403.1	120	15553
47	0	329	0	964.2	0	10129	3188.49	237.817	122	1396.2	0.0	3508.8	439	0	329	0	907.7	0	10129
48	0	0	0	44.5	0	1931	1075.03	341.767	132	353.8	0.0	0.0	0	0	0	0	28.5	0	1931
49	0	0	0	173.2	0	2008	892.67	334.233	184	157.3	108.2	180.9	0	0	0	0	150.7	0	2008
50	0	0	0	402.7	15	2766	1330.91	367.639	92	87.3	474.3	35.1	0	0	0	0	363.8	15	2766
51	0	58	0	364.9	36	5291	3273.33	420.120	0	181.2	200.3	803.0	0	0	58	0	319.0	36	5291
52	0	78	0	1077.2	0	5999	2897.08	0.000	0	0.0	0.0	2022.3	0	0	78	0	1001.7	0	5999
53	0	12	0	20148.1	0	55149	2319.48	203.693	38	3767.5	12238.9	14910.1	1576	0	12	0	20083.4	0	55149
54	0	358	0	1230.1	0	7148	2080.94	41.000	43	1210.8	6.4	2201.5	0	0	358	0	1206.3	0	7148

BASNO	EF20	MF20	FWET85	NFWET85	QUARRY85	TRANS20	AG20	WATER85	TOT20	RESOTH30	COMMER30	INTIC30	DF30	EF30	MF30	FWET85	NFWET85	QUARRY85
55	797.53	4752.78	67	0	1478	0	3290.13	0	11277	856.85	77.000	0	0.0	794.33	4733.69	67	0	1478
56	1006.00	3780.00	0	0	3671	17	2202.00	178	10987	133.00	0.000	0	0.0	1006.00	3780.00	0	0	3671
57	4158.00	1692.00	0	0	94	0	348.00	0	6524	36.00	38.000	158	0.0	4158.00	1692.00	0	0	94
58	1656.00	3883.00	376	0	1809	30	1681.00	0	9437	2.00	0.000	0	0.0	1656.00	3883.00	376	0	1809
59	7673.62	891.30	95049	759	0	0	4981.89	1868	129320	4730.15	33.000	744	12779.9	7590.92	881.70	95049	759	0
60	40.33	359.87	1	0	32	0	0.00	39	7548	6253.97	555.626	289	116.9	26.25	234.22	1	0	32

BASNO	TRANS30	AG30	WATER85	TOT30	RESOTH40	COMMER40	INTIC40	DF40	EF40	MF40	FWET85	NFWET85	QUARRY85	TRANS40	AG40	WATER85	TOT40
55	0	3270.12	0	11277	900.91	77.000	0	0.0	790.99	4713.80	67	0	1478	0	3249.30	0	11277
56	17	2202.00	178	10987	133.00	0.000	0	0.0	1006.00	3780.00	0	0	3671	17	2202.00	178	10987
57	0	348.00	0	6524	36.00	38.000	158	0.0	4158.00	1692.00	0	0	94	0	348.00	0	6524
58	30	1681.00	0	9437	2.00	0.000	0	0.0	1656.00	3883.00	376	0	1809	30	1681.00	0	9437
59	0	4884.35	1868	129320	5072.85	33.000	744	12634.7	7504.69	871.68	95049	759	0	0	4783.08	1868	129320
60	0	0.00	39	7548	6253.97	555.626	289	116.9	26.25	234.22	1	0	32	0	0.00	39	7548

BASNO	RESOTH85	COMMER85	INTCIC85	DF85	EF85	MF85	FHET85	NFHET85	QUARRY85	TRANS85	AG85	WATER85	TOT85	RESOTH90	COMMER90	INTCIC90	DF90	EF90	MF90	FHET85	NFHET85
01	706	2	198	2830	0	0	0	0	0	0	7675	46	11457	821.21	2.00	198	2820.73	0.000	0.000	0	0
02	1319	300	0	1204	0	21	88	0	0	0	2965	0	5897	1351.66	321.23	0	1199.01	0.000	20.913	88	0
03	2309	159	56	3062	211	944	0	0	0	0	13324	122	20187	2467.56	165.98	56	3057.08	210.661	942.485	0	0
04	399	0	56	2281	318	720	0	41	0	0	7304	0	11119	399.00	0.00	56	2281.00	318.000	720.000	0	41
05	324	0	0	2097	251	341	0	0	0	0	5933	0	8946	324.00	0.00	0	2097.00	251.000	341.000	0	0
06	0	0	74	880	0	0	0	0	0	0	735	28	1717	0.00	0.00	74	880.00	0.000	0.000	0	0
07	526	79	84	2534	122	40	0	0	0	0	1763	0	5148	539.06	80.75	84	2527.03	121.664	39.890	0	0
08	1565	74	0	4583	54	0	0	0	160	42	6779	0	13257	1630.32	82.75	0	4574.99	53.906	0.000	0	0
09	301	163	152	339	0	41	0	0	0	0	1111	0	2107	306.05	163.68	152	338.77	0.000	40.972	0	0

BASNO	QUARRY85	TRANS90	AG90	WATER85	TOT90	RESOTH00	COMMER00	INTCIC00	DF00	EF00	MF00	FHET85	NFHET85	QUARRY85	TRANS00	AG00	WATER85	TOT00
01	0	0.000	7569.1	46	11457	1091.91	2.00	198	2798.40	0.000	0.000	0	0	0	0.0000	7320.7	46	1145[illegible]
02	0	0.000	2916.2	0	5897	1428.41	371.11	0	1186.99	0.000	20.703	88	0	0	0.0000	2801.8	0	589[illegible]
03	0	0.000	13165.2	122	20187	2840.12	182.37	56	3045.01	209.829	938.763	0	0	0	0.0000	12792.9	122	2018[illegible]
04	0	0.000	7304.0	0	11119	399.00	0.00	56	2281.00	318.000	720.000	0	41	0	0.0000	7304.0	0	1111[illegible]
05	0	0.000	5933.0	0	8946	324.00	0.00	0	2097.00	251.000	341.000	0	0	0	0.0000	5933.0	0	894[illegible]
06	0	0.000	735.0	28	1717	0.00	0.00	74	880.00	0.000	0.000	0	0	0	0.0000	735.0	28	171[illegible]
07	0	0.000	1755.6	0	5148	569.76	84.86	84	2510.64	120.875	39.631	0	0	0	0.0000	1738.2	0	514[illegible]
08	160	0.000	6755.0	0	13257	1783.81	103.32	0	4531.94	53.398	0.000	0	0	160	0.0000	6624.5	0	1325[illegible]
09	0	0.000	1105.5	0	2107	317.91	165.27	152	338.21	0.000	40.904	0	0	0	0.0000	1092.7	0	210[illegible]

BASNO	RESOTH10	COMMER10	INTCIC10	DF10	EF10	MF10	FHET85	NFHET85	QUARRY85	TRANS10	AG10	WATER85	TOT10	RESOTH20	COMMER20	INTCIC20	DF20
01	1337.98	2.00	198	2776.89	0.000	0.000	0	0	0	0.0000	7096.1	46	11457	1570.21	2.00	198	2755.52
02	1498.17	416.46	0	1175.40	0.000	20.501	88	0	0	0.0000	2698.5	0	5897	1564.01	459.26	0	1163.88
03	3178.79	197.27	56	3032.90	208.995	935.030	0	0	0	0.0000	12456.0	122	20187	3498.40	211.33	56	3020.48
04	399.00	0.00	56	2281.00	318.000	720.000	0	41	0	0.0000	7304.0	0	11119	399.00	0.00	56	2281.00
05	324.00	0.00	0	2097.00	251.000	341.000	0	0	0	0.0000	5933.0	0	8946	324.00	0.00	0	2097.00
06	0.00	0.00	74	880.00	0.000	0.000	0	0	0	0.0000	735.0	28	1717	0.00	0.00	74	880.00
07	597.67	88.60	84	2495.71	120.157	39.396	0	0	0	0.0000	1722.5	0	5148	624.00	92.13	84	2481.60
08	1923.34	122.02	0	4492.45	52.933	0.000	0	0	160	0.0000	6506.3	0	13257	2055.02	139.66	0	4454.85
09	328.69	166.71	152	337.68	0.000	40.840	0	0	0	0.0000	1081.1	0	2107	338.86	168.07	152	337.16

BASNO	EF20	MF20	FWET85	NFWET85	QUARRY85	TRANS20	AG20	WATER85	TOT20	RESOTH30	COMMER30	INTIC30	DF30	EF30	MF30	FWET85	NFWET85	QUARRY85
01	0.000	0.000	0	0	0	0.000	6885.3	46	11457	1761.05	2.00	198	2737.12	0.000	0.000	0	0	0
02	0.000	20.300	88	0	0	0.000	2601.6	0	5897	1618.11	494.42	0	1153.95	0.000	20.127	88	0	0
03	208.139	931.201	0	0	0	0.000	12139.4	122	20187	3761.06	222.89	56	3009.49	207.382	927.812	0	0	0
04	318.000	720.000	0	41	0	0.000	7304.0	0	11119	399.00	0.00	56	2281.00	318.000	720.000	0	41	0
05	251.000	341.000	0	0	0	0.000	5933.0	0	8946	324.00	0.00	0	2097.00	251.000	341.000	0	0	0
06	0.000	0.000	0	0	0	0.000	735.0	28	1717	0.00	0.00	74	880.00	0.000	0.000	0	0	0
07	119.477	39.173	0	0	0	0.000	1707.6	0	5148	645.65	95.03	84	2470.00	118.919	38.990	0	0	0
08	52.490	0.000	0	0	160	0.000	6395.0	0	13257	2163.23	154.16	0	4423.71	52.123	0.000	0	0	160
09	0.000	40.778	0	0	0	0.000	1070.1	0	2107	347.23	169.19	152	336.73	0.000	40.725	0	0	0

BASNO	TRANS30	AG30	WATER85	TOT30	RESOTH40	COMMER40	INTIC40	DF40	EF40	MF40	FWET85	NFWET85	QUARRY85	TRANS40	AG40	WATER85	TOT40
01	0.0000	6712.8	46	11457	1959.81	2.00	198	2717.22	0.000	0.000	0	0	0	0.000	6534.0	46	11457
02	0.0000	2522.4	0	5897	1674.46	531.05	0	1143.21	0.000	19.940	88	0	0	0.000	2440.3	0	5897
03	0.0000	11880.4	122	20187	4034.61	234.93	56	2997.37	206.546	924.074	0	0	0	0.000	11611.5	122	20187
04	0.0000	7304.0	0	11119	399.00	0.00	56	2281.00	318.000	720.000	0	41	0	0.000	7304.0	0	11119
05	0.0000	5933.0	0	8946	324.00	0.00	0	2097.00	251.000	341.000	0	0	0	0.000	5933.0	0	8946
06	0.0000	735.0	28	1717	0.00	0.00	74	880.00	0.000	0.000	0	0	0	0.000	735.0	28	1717
07	0.0000	1695.4	0	5148	668.18	98.05	84	2457.89	118.336	38.799	0	0	0	0.000	1682.7	0	5148
08	0.0000	6303.8	0	13257	2275.92	169.26	0	4391.06	51.738	0.000	0	0	160	0.000	6209.0	0	13257
09	0.0000	1061.1	0	2107	355.93	170.36	152	336.26	0.000	40.669	0	0	0	0.000	1051.8	0	2107

BASNO	RESOTH85	COMMER85	INTCIC85	DF85	EF85	MF85	FWET85	NFWET85	QUARRY85	TRANS85	AG85	WATER85	TOT85	RESOTH90	COMMER90	INTCIC90	DF90	EF90	MF90	FWET85
10	3701	369	262	1912	0	0	0	0	87	110	2362	0	8803	3739.90	374.21	262	1912.0	0	0.000	0
11	368	294	1516	634	0	0	384	6	204	0	153	172	3731	368.00	294.00	1516	634.0	0	0.000	384
12	2146	190	0	1368	0	0	0	0	0	99	1051	0	4854	2146.00	190.00	0	1368.0	0	0.000	0
13	2862	20	0	2743	0	0	0	0	0	0	3716	0	9341	2937.72	23.33	0	2722.3	0	0.000	0
14	2648	122	28	1142	0	193	28	0	22	85	3629	30	7927	2747.77	126.39	28	1140.8	0	192.801	28
15	2792	857	3052	313	0	0	0	0	0	0	167	0	7181	2792.00	857.00	3052	313.0	0	0.000	0
16	4698	1184	133	1288	0	0	0	0	54	0	452	0	7809	4744.92	1214.49	133	1241.4	0	0.000	0
17	140	5	0	1305	0	0	0	0	0	83	557	0	2090	140.89	5.04	0	1305.0	0	0.000	0
18	2705	79	138	1824	0	0	0	0	48	0	1027	0	5821	2756.37	85.88	138	1793.6	0	0.000	0

BASNO	NFWET85	QUARRY85	TRANS90	AG90	WATER85	TOT90	RESOTH00	COMMER00	INTCIC00	DF00	EF00	MF00	FWET85	NFWET85	QUARRY85	TRANS00	AG00	WATER85
10	0	87	65.890	2362.0	0	8803	3831.29	386.46	262	1901.5	0	0.000	0	0	87	0.0000	2334.8	0
11	6	204	0.000	153.0	172	3731	368.00	294.00	1516	634.0	0	0.000	384	6	204	0.0000	153.0	172
12	0	0	99.000	1051.0	0	4854	2146.00	190.00	0	1368.0	0	0.000	0	0	0	99.0000	1051.0	0
13	0	0	0.000	3657.7	0	9341	3115.62	31.16	0	2673.3	0	0.000	0	0	0	0.0000	3520.9	0
14	0	22	0.000	3611.2	30	7927	2982.19	136.70	28	1129.3	0	190.848	28	0	22	0.0000	3380.0	30
15	0	0	0.000	167.0	0	7181	2792.00	857.00	3052	313.0	0	0.000	0	0	0	0.0000	167.0	0
16	0	54	0.000	421.1	0	7809	4855.15	1286.15	133	1131.2	0	0.000	0	0	54	0.0000	349.5	0
17	0	0	82.070	557.0	0	2090	142.98	5.13	0	1305.0	0	0.000	0	0	0	79.8849	557.0	0
18	0	48	0.000	999.2	0	5821	2877.07	102.06	138	1721.7	0	0.000	0	0	48	0.0000	934.1	0

BASNO	TOT00	RESOTH10	COMMER10	INTCIC10	DF10	EF10	MF10	FWET85	NFWET85	QUARRY85	TRANS10	AG10	WATER85	TOT10	RESOTH20	COMMER20	INTCIC20
10	8803	3914.37	397.59	262	1876.2	0	0.000	0	0	87	0.0000	2265.8	0	8803	3992.8	408.10	262
11	3731	368.00	294.00	1516	634.0	0	0.000	384	6	204	0.0000	153.0	172	3731	368.0	294.00	1516
12	4854	2146.00	190.00	0	1368.0	0	0.000	0	0	0	99.0000	1051.0	0	4854	2146.0	190.00	0
13	9341	3277.35	38.28	0	2628.0	0	0.000	0	0	0	0.0000	3397.4	0	9341	3430.0	44.99	0
14	7927	3195.28	146.08	28	1116.8	0	188.743	28	0	22	0.0000	3172.1	30	7927	3396.4	154.93	28
15	7181	2792.00	857.00	3052	313.0	0	0.000	0	0	0	0.0000	167.0	0	7181	2792.0	857.00	3052
16	7809	4955.35	1351.28	133	1028.9	0	0.000	0	0	54	0.0000	286.4	0	7809	5049.9	1412.75	133
17	2090	144.89	5.22	0	1305.0	0	0.000	0	0	0	77.8986	557.0	0	2090	146.7	5.29	0
18	5821	2986.78	116.76	138	1655.8	0	0.000	0	0	48	0.0000	875.7	0	5821	3090.3	130.63	138

BASNO	DF20	EF20	MF20	FWET85	NFWET85	QUARRY85	TRANS20	AG20	WATER85	TOT20	RESOTH30	COMMER30	INTIC30	DF30	EF30	MF30	FWET85	NFWET85
10	1852.0	0	0.000	0	0	87	0.000	2201.1	0	8803	4057.2	416.73	262	1832.0	0	0.000	0	0
11	634.0	0	0.000	384	6	204	0.000	153.0	172	3731	368.0	294.00	1516	634.0	0	0.000	384	6
12	1368.0	0	0.000	0	0	0	99.000	1051.0	0	4854	2146.0	190.00	0	1368.0	0	0.000	0	0
13	2584.5	0	0.000	0	0	0	0.000	3281.5	0	9341	3555.4	50.51	0	2548.3	0	0.000	0	0
14	1103.3	0	186.464	28	0	22	0.000	2977.9	30	7927	3561.7	162.20	28	1090.8	0	184.353	28	0
15	313.0	0	0.000	0	0	0	0.000	167.0	0	7181	2792.0	857.00	3052	313.0	0	0.000	0	0
16	930.4	0	0.000	0	0	54	0.000	228.9	0	7809	5127.6	1463.26	133	847.6	0	0.000	0	0
17	1305.0	0	0.000	0	0	0	76.024	557.0	0	2090	148.2	5.36	0	1305.0	0	0.000	0	0
18	1593.0	0	0.000	0	0	48	0.000	821.0	0	5821	3175.4	142.04	138	1540.9	0	0.000	0	0

BASNO	QUARRY85	TRANS30	AG30	WATER85	TOT30	RESOTH40	COMMER40	INTIC40	DF40	EF40	MF40	FWET85	NFWET85	QUARRY85	TRANS40	AG40	WATER85	TOT40
10	87	0.0000	2148.1	0	8803	4124.3	425.73	262	1810.8	0	0.000	0	0	87	0.000	2093.1	0	8803
11	204	0.0000	153.0	172	3731	368.0	294.00	1516	634.0	0	0.000	384	6	204	0.000	153.0	172	3731
12	0	99.0000	1051.0	0	4854	2146.0	190.00	0	1368.0	0	0.000	0	0	0	99.000	1051.0	0	4854
13	0	0.0000	3186.8	0	9341	3686.0	56.26	0	2510.1	0	0.000	0	0	0	0.000	3088.6	0	9341
14	22	0.0000	2820.0	30	7927	3733.8	169.77	28	1076.6	0	181.943	28	0	22	0.000	2656.9	30	7927
15	0	0.0000	167.0	0	7181	2792.0	857.00	3052	313.0	0	0.000	0	0	0	0.000	167.0	0	7181
16	54	0.0000	183.5	0	7809	5208.6	1515.87	133	759.6	0	0.000	0	0	54	0.000	138.0	0	7809
17	0	74.4834	557.0	0	2090	149.7	5.43	0	1305.0	0	0.000	0	0	0	72.879	557.0	0	2090
18	48	0.0000	776.6	0	5821	3264.0	153.91	138	1486.2	0	0.000	0	0	48	0.000	730.8	0	5821

BASNO	RESOTH85	COMMER85	INTIC85	DF85	EF85	MF85	FWET85	NFWET85	QUARRY85	TRANS85	AG85	WATER85	TOT85	RESOTH90	COMMER90	INTIC90	DF90	EF90	MF90	FWET85
19	1939	71	0	3296	0	77	252	0	5	55	1237	0	6932	1979.68	76.45	0	3296.0	0	77.000	252
20	597	620	1225	0	0	0	0	0	36	0	0	69	2547	597.00	620.00	1225	0.0	0	0.000	0
21	2988	1504	361	896	0	0	0	0	21	0	704	0	6474	3088.36	1569.24	361	839.1	0	0.000	0
22	5679	2218	375	1528	0	175	0	0	0	30	725	0	10730	6179.92	2543.60	375	1134.2	0	129.900	0
23	777	327	16	30	0	0	0	0	0	0	0	0	1150	777.00	327.00	16	30.0	0	0.000	0
24	1432	488	49	793	0	0	0	0	0	200	143	0	3105	1483.07	521.20	49	793.0	0	0.000	0
25	3151	580	185	460	0	0	0	0	2	0	91	302	4771	3238.89	676.68	185	339.4	0	0.000	0
26	1791	733	150	91	0	0	0	0	0	0	140	0	2905	1791.00	733.00	150	91.0	0	0.000	0
27	3298	1187	213	109	0	0	0	0	0	19	18	0	4844	3298.00	1187.00	213	109.0	0	0.000	0

BASNO	NFWET85	QUARRY85	TRANS90	AG90	WATER85	TOT90	RESOTH00	COMMER00	INTIC00	DF00	EF00	MF00	FWET85	NFWET85	QUARRY85	TRANS00	AG00	WATER85
19	0	5	8.869	1237.0	0	6932	2075.26	89.26	0	3232.3	0	75.511	252	0	5	0.000	1202.7	0
20	0	36	0.000	0.0	69	2547	597.00	620.00	1225	0.0	0	0.000	0	0	36	0.000	0.0	69
21	0	21	0.000	595.3	0	6474	3324.18	1722.51	361	698.2	0	0.000	0	0	21	0.000	347.1	0
22	0	0	0.000	367.4	0	10730	6843.55	2974.95	375	481.4	0	55.131	0	0	0	0.000	0.0	0
23	0	0	0.000	0.0	0	1150	777.00	327.00	16	30.0	0	0.000	0	0	0	0.000	0.0	0
24	0	0	115.731	143.0	0	3105	1603.07	599.20	49	726.3	0	0.000	0	0	0	0.000	127.4	0
25	0	2	0.000	27.0	302	4771	3299.79	743.66	185	238.6	0	0.000	0	0	2	0.000	0.0	302
26	0	0	0.000	140.0	0	2905	1791.00	733.00	150	91.0	0	0.000	0	0	0	0.000	140.0	0
27	0	0	19.000	18.0	0	4844	3298.00	1187.00	213	109.0	0	0.000	0	0	0	19.000	18.0	0

BASNO	TOT00	RESOTH10	COMMER10	INTIC10	DF10	EF10	MF10	FWET85	NFWET85	QUARRY85	TRANS10	AG10	WATER85	TOT10	RESOTH20	COMMER20	INTIC20
19	6932	2162.15	100.90	0	3169.1	0	74.035	252	0	5	0.0000	1168.8	0	6932	2244.1	111.89	0
20	2547	597.00	620.00	1225	0.0	0	0.000	0	0	36	0.0000	0.0	69	2547	597.0	620.00	1225
21	6474	3538.54	1861.85	361	547.0	0	0.000	0	0	21	0.0000	144.7	0	6474	3740.8	1993.35	361
22	10730	6843.55	2974.95	375	481.4	0	55.131	0	0	0	0.0000	0.0	0	10730	6843.5	2974.95	375
23	1150	777.00	327.00	16	30.0	0	0.000	0	0	0	0.0000	0.0	0	1150	777.0	327.00	16
24	3105	1712.16	670.10	49	585.4	0	0.000	0	0	0	0.0000	88.3	0	3105	1815.1	737.02	49
25	4771	3299.79	743.66	185	238.6	0	0.000	0	0	2	0.0000	0.0	302	4771	3299.8	743.66	185
26	2905	1791.00	733.00	150	91.0	0	0.000	0	0	0	0.0000	140.0	0	2905	1791.0	733.00	150
27	4844	3298.00	1187.00	213	109.0	0	0.000	0	0	0	19.0000	18.0	0	4844	3298.0	1187.00	213

BASNO	DF20	EF20	MF20	FWET85	NFWET85	QUARRY85	TRANS20	AG20	WATER85	TOT20	RESOTH30	COMMER30	INTIC30	DF30	EF30	MF30	FWET85	NFWET85
19	3109.3	0	72.638	252	0	5	0.0000	1137.0	0	6932	2311.5	120.92	0	3060.1	0	71.488	252	0
20	0.0	0	0.000	0	0	36	0.0000	0.0	69	2547	597.0	620.00	1225	0.0	0	0.000	0	0
21	357.8	0	0.000	0	0	21	0.0000	0.0	0	6474	3761.5	2006.78	361	323.7	0	0.000	0	0
22	481.4	0	55.131	0	0	0	0.0000	0.0	0	10730	6843.5	2974.95	375	481.4	0	55.131	0	0
23	30.0	0	0.000	0	0	0	0.0000	0.0	0	1150	777.0	327.00	16	30.0	0	0.000	0	0
24	450.0	0	0.000	0	0	0	0.0000	53.9	0	3105	1899.7	792.01	49	336.1	0	0.000	0	0
25	238.6	0	0.000	0	0	2	0.0000	0.0	302	4771	3299.8	743.66	185	238.6	0	0.000	0	0
26	91.0	0	0.000	0	0	0	0.0000	140.0	0	2905	1791.0	733.00	150	91.0	0	0.000	0	0
27	109.0	0	0.000	0	0	0	19.0000	18.0	0	4844	3298.0	1187.00	213	109.0	0	0.000	0	0

BASNO	QUARRY85	TRANS30	AG30	WATER85	TOT30	RESOTH40	COMMER40	INTIC40	DF40	EF40	MF40	FWET85	NFWET85	QUARRY85	TRANS40	AG40	WATER85	TOT40
19	5	0	1111.0	0	6932	2381.7	130.32	0	3008.7	0	70.288	252	0	5	0	1084.0	0	6932
20	36	0	0.0	69	2547	597.0	620.00	1225	0.0	0	0.000	0	0	36	0	0.0	69	2547
21	21	0	0.0	0	6474	3761.5	2006.78	361	323.7	0	0.000	0	0	21	0	0.0	0	6474
22	0	0	0.0	0	10730	6843.5	2974.95	375	481.4	0	55.131	0	0	0	0	0.0	0	10730
23	0	0	0.0	0	1150	777.0	327.00	16	30.0	0	0.000	0	0	0	0	0.0	0	1150
24	0	0	28.2	0	3105	1987.8	849.28	49	214.0	0	0.000	0	0	0	0	4.9	0	3105
25	2	0	0.0	302	4771	3299.8	743.66	185	238.6	0	0.000	0	0	2	0	0.0	302	4771
26	0	0	140.0	0	2905	1791.0	733.00	150	91.0	0	0.000	0	0	0	0	140.0	0	2905
27	0	19	18.0	0	4844	3298.0	1187.00	213	109.0	0	0.000	0	0	0	19	18.0	0	4844

BASNO	RESOTH85	COMMER85	INTCIC85	DF85	EF85	MF85	FWET85	NFWET85	QUARRY85	TRANS85	AG85	WATER85	TOT85	RESOTH90	COMMER90	INTCIC90	DF90	EF90	MF90
28	1088	385	129	61	0	0	0	0	0	48	107	11	1829	1147.3	450.240	129	61.0	0.0	0.0
29	5546	680	194	3881	0	0	3869	0	0	390	11195	53	25808	6230.1	771.673	194	3857.8	0.0	0.0
30	1172	373	40	207	0	0	0	0	0	0	415	0	2207	1220.4	404.460	40	204.2	0.0	0.0
31	3801	630	501	1701	0	726	90	0	14	49	2122	0	9634	4238.7	914.490	501	1518.6	0.0	648.2
32	1626	130	726	1848	0	0	0	0	90	335	2298	24	7077	1759.3	216.659	726	1848.0	0.0	0.0
33	1169	442	1572	11512	0	0	2499	872	0	0	14148	156	32370	1266.7	455.090	1572	11478.8	0.0	0.0
34	1312	56	1478	5809	0	90	2553	133	0	0	5860	19	17310	1462.0	62.598	1478	5753.5	0.0	89.1
35	823	261	70	780	0	0	0	0	0	0	1996	11	3941	841.1	272.773	70	777.6	0.0	0.0
36	1151	263	0	522	0	0	1	0	0	0	1053	0	2990	1178.0	280.563	0	516.6	0.0	0.0

BASNO	FWET85	NFWET85	QUARRY85	TRANS90	AG90	WATER85	TOT90	RESOTH00	COMMER00	INTCIC00	DF00	EF00	MF00	FWET85	NFWET85	QUARRY85	TRANS00	AG00
28	0	0	0	0.000	30.4	11	1829	1147.3	450.24	129	61.0	0.0	0.0	0	0	0	0.000	30.4
29	3869	0	0	0.000	10832.4	53	25808	7837.6	987.07	194	3788.5	0.0	0.0	3869	0	0	0.000	9078.9
30	0	0	0	0.000	337.9	0	2207	1334.1	478.38	40	191.3	0.0	0.0	0	0	0	0.000	163.2
31	90	0	14	0.000	1709.0	0	9634	5267.0	1582.93	501	1042.0	0.0	444.7	90	0	14	0.000	692.3
32	0	0	90	115.019	2298.0	24	7077	2072.6	420.28	726	1727.4	0.0	0.0	0	0	90	0.000	2016.7
33	2499	872	0	0.000	14070.4	156	32370	1496.2	485.85	1572	11400.6	0.0	0.0	2499	872	0	0.000	13888.3
34	2553	133	0	0.000	5759.8	19	17310	1814.3	78.10	1478	5622.5	0.0	87.1	2553	133	0	0.000	5525.0
35	0	0	0	0.000	1968.5	11	3941	883.7	300.44	70	771.9	0.0	0.0	0	0	0	0.000	1903.9
36	1	0	0	0.000	1013.8	0	2990	1241.5	321.83	0	503.4	0.0	0.0	1	0	0	0.000	922.3

BASNO	WATER85	TOT00	RESOTH10	COMMER10	INTCIC10	DF10	EF10	MF10	FWET85	NFWET85	QUARRY85	TRANS10	AG10	WATER85	TOT10	RESOTH20	COMMER20
28	11	1829	1147.3	450.24	129	61.0	0.0	0.0	0	0	0	0.0000	30.4	11	1829	1147.3	450.24
29	53	25808	9298.8	1182.87	194	3677.8	0.0	0.0	3869	0	0	0.0000	7532.5	53	25808	10677.8	1367.66
30	0	2207	1437.5	545.57	40	156.4	0.0	0.0	0	0	0	0.0000	27.5	0	2207	1482.1	574.56
31	0	9634	6201.9	2190.57	501	446.1	0.0	190.4	90	0	14	0.0000	0.0	0	9634	6295.7	2251.57
32	24	7077	2357.3	605.37	726	1590.1	0.0	0.0	0	0	90	0.0000	1684.1	24	7077	2626.1	780.05
33	156	32370	1704.9	513.81	1572	11329.2	0.0	0.0	2499	872	0	0.0000	13723.1	156	32370	1901.8	540.19
34	19	17310	2134.6	92.19	1478	5502.0	0.0	85.2	2553	133	0	0.0000	5313.0	19	17310	2436.8	105.49
35	11	3941	922.4	325.58	70	766.5	0.0	0.0	0	0	0	0.0000	1845.6	11	3941	958.9	349.31
36	0	2990	1299.2	359.34	0	490.0	0.0	0.0	1	0	0	0.0000	840.4	0	2990	1353.7	394.75

BASNO	INTCIC20	DF20	EF20	MF20	FHET85	NFHET85	QUARRY85	TRANS20	AG20	WATER85	TOT20	RESOTH30	COMMER30	INTCIC30	DF30	EF30	MF30
28	129	61.0	0.0	0.0	0	0	0	0.0000	30.4	11	1829	1147.3	450.24	129	61.0	0.0	0.0
29	194	3527.1	0.0	0.0	3869	0	0	0.0000	6119.4	53	25808	11811.1	1519.52	194	3361.9	0.0	0.0
30	40	110.4	0.0	0.0	0	0	0	0.0000	0.0	0	2207	1482.1	574.56	40	110.4	0.0	0.0
31	501	337.6	0.0	144.1	90	0	14	0.0000	0.0	0	9634	6295.7	2251.57	501	337.6	0.0	144.1
32	726	1451.0	0.0	0.0	0	0	90	0.0000	1379.8	24	7077	2846.9	923.60	726	1328.2	0.0	0.0
33	1572	11261.5	0.0	0.0	2499	872	0	0.0000	13567.5	156	32370	2063.6	561.88	1572	11205.7	0.0	0.0
34	1478	5387.1	0.0	83.5	2553	133	0	0.0000	5114.1	19	17310	2685.2	116.42	1478	5291.6	0.0	82.0
35	70	761.0	0.0	0.0	0	0	0	0.0000	1790.8	11	3941	988.9	368.82	70	756.3	0.0	0.0
36	0	476.3	0.0	0.0	1	0	0	0.0000	764.3	0	2990	1398.4	423.84	0	464.0	0.0	0.0

BASNO	FHET85	NFHET85	QUARRY85	TRANS30	AG30	WATER85	TOT30	RESOTH40	COMMER40	INTCIC40	DF40	EF40	MF40	FHET85	NFHET85	QUARRY85	TRANS40	AG40	WATER85	TOT40
28	0	0	0	0	30.4	11	1829	1147.3	450.24	129	61.0	0.0	0.0	0	0	0	0	30.4	11	1829
29	3869	0	0	0	4999.5	53	25808	12991.3	1677.67	194	3149.6	0.0	0.0	3869	0	0	0	3873.4	53	25808
30	0	0	0	0	0.0	0	2207	1482.1	574.56	40	110.4	0.0	0.0	0	0	0	0	0.0	0	2207
31	90	0	14	0	0.0	0	9634	6295.7	2251.57	501	337.6	0.0	144.1	90	0	14	0	0.0	0	9634
32	0	0	90	0	1138.3	24	7077	3076.9	1073.10	726	1192.0	0.0	0.0	0	0	90	0	895.0	24	7077
33	2499	872	0	0	13439.8	156	32370	2232.2	584.46	1572	11147.3	0.0	0.0	2499	872	0	0	13307.1	156	32370
34	2553	133	0	0	4951.8	19	17310	2943.9	127.80	1478	5191.3	0.0	80.4	2553	133	0	0	4783.5	19	17310
35	0	0	0	0	1746.0	11	3941	1020.1	389.13	70	751.2	0.0	0.0	0	0	0	0	1699.5	11	3941
36	1	0	0	0	702.7	0	2990	1445.1	454.14	0	450.3	0.0	0.0	1	0	0	0	639.5	0	2990

BASNO	RESOTH85	COMMER85	INTCIC85	DF85	EF85	MF85	FHET85	NFHET85	QUARRY85	TRANS85	AG85	WATER85	TOT85	RESOTH90	COMMER90	INTCIC90	DF90	EF90	MF90	FHET85
37	1705	376	1203	4424	0	0	301	0	0	0	4784	49	12842	1827.9	455.904	1203	4356.0	0.0	0.0	301
38	1048	233	786	6848	0	0	940	0	61	287	9391	91	19685	1070.0	247.282	786	6848.0	0.0	0.0	940
39	817	180	200	875	0	0	0	0	0	0	1413	0	3485	828.6	187.527	200	871.1	0.0	0.0	0
40	877	32	171	1517	0	0	6733	0	0	54	4078	54	13516	908.2	32.000	171	1517.0	0.0	0.0	6733
41	2309	128	11	1334	0	12	0	0	0	0	3509	0	7303	2525.5	137.524	11	1318.3	0.0	11.9	0
42	364	0	0	1688	0	0	2609	0	0	0	1694	133	6488	364.3	0.000	0	1687.9	0.0	0.0	2609
43	1522	12	28	320	0	479	0	0	0	0	1788	0	4149	1713.2	37.624	28	310.8	0.0	465.2	0
44	2693	72	0	2170	544	3211	2806	0	0	0	4085	585	16166	2970.3	84.203	0	2120.0	531.5	3137.0	2806
45	13093	699	1063	42	53926	38158	2632	35	33	690	12571	189	123131	14147.1	745.381	1063	41.8	53721.9	38013.6	2632

BASNO	NFHET85	QUARRY85	TRANS90	AG90	WATER85	TOT90	RESOTH00	COMMER00	INTCIC00	DF00	EF00	MF00	FHET85	NFHET85	QUARRY85	TRANS00	AG00	WATER85
37	0	0	0.000	4649.2	49	12842	2116.8	643.648	1203	4194.7	0.0	0.0	301	0	0	0.000	4333.9	49
38	0	61	250.745	9391.0	91	19685	1121.6	280.841	786	6848.0	0.0	0.0	940	0	61	165.559	9391.0	91
39	0	0	0.000	1397.8	0	3485	855.8	205.213	200	861.8	0.0	0.0	0	0	0	0.000	1362.1	0
40	0	0	22.822	4078.0	54	13516	981.4	32.000	171	1516.1	0.0	0.0	6733	0	0	0.000	4028.5	54
41	0	0	0.000	3298.8	0	7303	3034.1	159.903	11	1276.6	0.0	11.5	0	0	0	0.000	2810.0	0
42	0	0	0.000	1693.8	133	6488	365.0	0.000	0	1687.7	0.0	0.0	2609	0	0	0.000	1693.3	133
43	0	0	0.000	1594.1	0	4149	2162.5	97.830	28	285.7	0.0	427.7	0	0	0	0.000	1147.2	0
44	0	0	0.000	3932.0	585	16166	3622.0	112.874	0	2001.6	501.8	2961.9	2806	0	0	0.000	3574.9	585
45	35	33	0.000	12509.1	189	123131	16623.8	854.357	1063	40.8	52438.0	37105.1	2632	35	33	0.000	12116.9	189

BASNO	TOT00	RESOTH10	COMMER10	INTCIC10	DF10	EF10	MF10	FHET85	NFHET85	QUARRY85	TRANS10	AG10	WATER85	TOT10	RESOTH20	COMMER20	INTCIC20
37	12842	2379.3	814.314	1203	4044.8	0.0	0.0	301	0	0	0.0000	4050.6	49	12842	2627.1	975.38	1203
38	19685	1168.5	311.346	786	6848.0	0.0	0.0	940	0	61	88.1219	9391.0	91	19685	1212.8	340.14	786
39	3485	880.5	221.290	200	853.3	0.0	0.0	0	0	0	0.0000	1329.9	0	3485	903.9	236.46	200
40	13516	1048.0	32.000	171	1515.1	0.0	0.0	6733	0	0	0.0000	3962.9	54	13516	1110.9	32.00	171
41	7303	3496.4	180.246	11	1226.7	0.0	11.0	0	0	0	0.0000	2377.6	0	7303	3932.7	199.44	11
42	6488	365.6	0.000	0	1687.4	0.0	0.0	2609	0	0	0.0000	1692.9	133	6488	366.2	0.00	0
43	4149	2571.0	152.560	28	253.4	0.0	379.3	0	0	0	0.0000	764.7	0	4149	2956.4	204.21	28
44	16166	4214.3	138.938	0	1892.2	474.4	2799.9	2806	0	0	0.0000	3255.3	585	16166	4773.3	163.53	0
45	123131	18875.3	953.421	1063	39.9	51269.8	36278.4	2632	35	33	0.0000	11762.1	189	123131	21000.1	1046.91	1063

BASNO	DF20	EF20	MF20	FWET85	NFWET85	QUARRY85	TRANS20	AG20	WATER85	TOT20	RESOTH30	COMMER30	INTCIC30	DF30	EF30	MF30	FWET85
37	3900.3	0.0	0.0	301	0	0	0.0000	3786.2	49	12842	2830.8	1107.74	1203	3779.2	0.0	0.0	301
38	6848.0	0.0	0.0	940	0	61	15.0412	9391.0	91	19685	1249.2	363.79	786	6835.9	0.0	0.0	940
39	845.1	0.0	0.0	0	0	0	0.0000	1299.5	0	3485	923.0	248.93	200	838.3	0.0	0.0	0
40	1513.9	0.0	0.0	6733	0	0	0.0000	3901.2	54	13516	1162.5	32.00	171	1512.9	0.0	0.0	6733
41	1168.3	0.0	10.5	0	0	0	0.0000	1981.0	0	7303	4291.3	215.22	11	1110.2	0.0	10.0	0
42	1687.2	0.0	0.0	2609	0	0	0.0000	1692.5	133	6488	366.7	0.00	0	1687.1	0.0	0.0	2609
43	212.2	0.0	317.7	0	0	0	0.0000	430.5	0	4149	3273.2	246.66	28	166.2	0.0	248.8	0
44	1787.2	448.0	2644.6	2806	0	0	0.0000	2958.3	585	16166	5232.7	183.75	0	1699.5	426.1	2514.8	2806
45	39.1	50166.3	35497.6	2632	35	33	0.0000	11429.0	189	123131	22746.2	1123.74	1063	38.4	49258.8	34855.5	2632

BASNO	NFWET85	QUARRY85	TRANS30	AG30	WATER85	TOT30	RESOTH40	COMMER40	INTCIC40	DF40	EF40	MF40	FWET85	NFWET85	QUARRY85	TRANS40	AG40	WATER85	TOT40
37	0	0	0	3571.3	49	12842	3042.8	1245.59	1203	3651.0	0.0	0.0	301	0	0	0	3349.6	49	12842
38	0	61	0	9358.1	91	19685	1287.1	388.43	786	6819.2	0.0	0.0	940	0	61	0	9312.3	91	19685
39	0	0	0	1274.7	0	3485	943.0	261.92	200	831.2	0.0	0.0	0	0	0	0	1248.9	0	3485
40	0	0	0	3850.6	54	13516	1216.3	32.00	171	1511.7	0.0	0.0	6733	0	0	0	3798.0	54	13516
41	0	0	0	1665.3	0	7303	4664.7	231.65	11	1040.2	0.0	9.4	0	0	0	0	1346.1	0	7303
42	0	0	0	1692.2	133	6488	367.2	0.00	0	1686.9	0.0	0.0	2609	0	0	0	1691.9	133	6488
43	0	0	0	186.1	0	4149	3603.1	290.86	28	90.9	0.0	136.1	0	0	0	0	0.0	0	4149
44	0	0	0	2718.1	585	16166	5711.2	204.80	0	1606.9	402.8	2377.8	2806	0	0	0	2471.5	585	16166
45	35	33	0	11156.5	189	123131	24564.7	1203.76	1063	37.6	48313.0	34186.2	2632	35	33	0	10873.7	189	123131

BASNO	RESOTH85	COMMER85	INTCIC85	DF85	EF85	MF85	FWET85	NFWET85	QUARRY85	TRANS85	AG85	WATER85	TOT85	RESOTH90	COMMER90	INTCIC90	DF90	EF90	MF90
46	2292	149	109	861	2814	4345	801	0	0	120	3942	120	15553	2416.71	154.487	109	860.4	2811.9	4341.8
47	1660	33	122	1756	0	4413	439	0	329	133	1244	0	10129	1800.45	51.820	122	1750.1	0.0	4398.2
48	600	33	132	1023	0	0	0	0	0	0	143	0	1931	643.65	61.372	132	962.4	0.0	0.0
49	660	183	184	240	165	276	0	0	0	0	300	0	2008	681.38	196.896	184	232.6	159.9	267.5
50	1053	187	92	117	636	47	0	0	0	0	619	15	2766	1078.54	203.598	92	114.4	621.8	45.9
51	2459	311	0	276	305	1223	0	0	58	0	623	36	5291	2533.83	321.027	0	267.5	295.6	1185.2
52	1821	0	0	0	0	2608	0	0	78	0	1492	0	5999	1919.88	0.000	0	0.0	0.0	2555.3
53	1531	169	38	3818	12403	15110	1576	0	12	0	20492	0	55149	1603.45	172.188	38	3813.4	12387.9	15091.7
54	1635	41	43	1315	7	2391	0	0	358	0	1358	0	7148	1675.98	41.000	43	1305.5	6.9	2373.7

BASNO	FWET85	NFWET85	QUARRY85	TRANS90	AG90	WATER85	TOT90	RESOTH00	COMMER00	INTCIC00	DF00	EF00	MF00	FWET85	NFWET85	QUARRY85	TRANS00	AG00	WATER85
46	801	0	0	0	3937.8	120	15553	2709.73	167.380	109	841.3	2749.6	4245.5	801	0	0	0	3809.5	120
47	439	0	329	0	1238.5	0	10129	2130.45	96.040	122	1666.4	0.0	4187.8	439	0	329	0	1158.3	0
48	0	0	0	0	131.5	0	1931	746.21	128.035	132	819.8	0.0	0.0	0	0	0	0	105.0	0
49	0	0	0	0	285.7	0	2008	731.61	229.548	184	215.1	147.9	247.4	0	0	0	0	252.4	0
50	0	0	0	0	594.8	15	2766	1138.54	242.598	92	108.2	588.0	43.5	0	0	0	0	538.2	15
51	0	0	58	0	593.9	36	5291	2709.64	344.586	0	247.3	273.3	1096.0	0	0	58	0	526.1	36
52	0	0	78	0	1445.8	0	5999	2152.20	0.000	0	0.0	0.0	2431.0	0	0	78	0	1337.8	0
53	1576	0	12	0	20454.4	0	55149	1773.68	179.678	38	3802.5	12352.5	15048.5	1576	0	12	0	20366.1	0
54	0	0	358	0	1344.0	0	7148	1772.26	41.000	43	1283.0	6.8	2332.9	0	0	358	0	1311.0	0

BASNO	TOT00	RESOTH10	COMMER10	INTCIC10	DF10	EF10	MF10	FWET85	NFWET85	QUARRY85	TRANS10	AG10	WATER85	TOT10	RESOTH20	COMMER20	INTCIC20
46	15553	2976.10	179.100	109	823.9	2692.7	4157.7	801	0	0	0	3693.5	120	15553	3227.48	190.161	109
47	10129	2430.43	136.237	122	1590.1	0.0	3996.0	439	0	329	0	1086.2	0	10129	2713.53	174.174	122
48	1931	839.44	188.633	132	689.2	0.0	0.0	0	0	0	0	81.8	0	1931	927.42	245.823	132
49	2008	777.27	259.228	184	199.1	136.8	228.9	0	0	0	0	222.7	0	2008	820.37	287.240	184
50	2766	1193.08	278.051	92	102.4	556.7	41.1	0	0	0	0	487.6	15	2766	1244.55	311.509	92
51	5291	2869.46	366.002	0	228.9	252.9	1014.1	0	0	58	0	465.7	36	5291	3020.29	386.213	0
52	5999	2363.39	0.000	0	0.0	0.0	2316.7	0	0	78	0	1240.9	0	5999	2562.71	0.000	0
53	55149	1928.43	186.487	38	3792.6	12320.3	15009.3	1576	0	12	0	20285.9	0	55149	2074.47	192.913	38
54	7148	1859.78	41.000	43	1262.6	6.7	2295.7	0	0	358	0	1281.2	0	7148	1942.37	41.000	43

BASNO	DF20	EF20	MF20	FHET85	NFHET85	QUARRY85	TRANS20	AG20	WATER85	TOT20	RESOTH30	COMMER30	INTCIC30	DF30	EF30	MF30	
46	807.4	2638.8	4074.5	801	0	0	0	3584.6	120	15553	3434.07	199.251	109	793.8	2594.4	4006.0	80
47	1517.8	0.0	3814.5	439	0	329	0	1018.9	0	10129	2946.19	205.349	122	1458.3	0.0	3664.9	43
48	564.9	0.0	0.0	0	0	0	0	60.8	0	1931	999.72	292.820	132	461.9	0.0	0.0	
49	183.7	126.3	211.2	0	0	0	0	195.3	0	2008	855.78	310.259	184	170.8	117.4	196.5	
50	96.9	526.5	38.9	0	0	0	0	440.7	15	2766	1286.85	339.004	92	92.2	501.2	37.0	
51	211.2	233.4	936.0	0	0	58	0	409.8	36	5291	3144.24	402.822	0	196.6	217.3	871.2	
52	0.0	0.0	2207.8	0	0	78	0	1150.5	0	5999	2726.50	0.000	0	0.0	0.0	2117.3	
53	3783.2	12289.9	14972.3	1576	0	12	0	20210.2	0	55149	2194.49	198.193	38	3775.5	12264.9	14941.8	157
54	1243.3	6.6	2260.6	0	0	358	0	1253.1	0	7148	2010.25	41.000	43	1227.4	6.5	2231.7	

BASNO	NFHET85	QUARRY85	TRANS30	AG30	WATER85	TOT30	RESOTH40	COMMER40	INTCIC40	DF40	EF40	MF40	FHET85	NFHET85	QUARRY85	TRANS40	AG40	WATER85	TOT40
46	0	0	0	3495.5	120	15553	3649.22	208.718	109	779.6	2548.0	3934.3	801	0	0	0	3403.1	120	15553
47	0	329	0	964.2	0	10129	3188.49	237.817	122	1396.2	0.0	3508.8	439	0	329	0	907.7	0	10129
48	0	0	0	44.5	0	1931	1075.03	341.767	132	353.8	0.0	0.0	0	0	0	0	28.5	0	1931
49	0	0	0	173.2	0	2008	892.67	334.233	184	157.3	108.2	180.9	0	0	0	0	150.7	0	2008
50	0	0	0	402.7	15	2766	1330.91	367.639	92	87.3	474.3	35.1	0	0	0	0	363.8	15	2766
51	0	58	0	364.9	36	5291	3273.33	420.120	0	181.2	200.3	803.0	0	0	58	0	319.0	36	5291
52	0	78	0	1077.2	0	5999	2897.08	0.000	0	0.0	0.0	2022.3	0	0	78	0	1001.7	0	5999
53	0	12	0	20148.1	0	55149	2319.48	203.693	38	3767.5	12238.9	14910.1	1576	0	12	0	20083.4	0	55149
54	0	358	0	1230.1	0	7148	2080.94	41.000	43	1210.8	6.4	2201.5	0	0	358	0	1206.3	0	7148

BASNO	RESOTH85	COMMER85	INTIC85	DF85	EF85	MF85	FWET85	NFWET85	QUARRY85	TRANS85	AG85	WATER85	TOT85	RESOTH90	COMMER90	INTIC90	DF90	EF90	MF90	FWET85
55	623	77	0	0	812	4839	67	0	1478	0	3381	0	11277	648.54	77.0000	0	0.0	810.07	4827.52	67
56	133	0	0	0	1006	3780	0	0	3671	17	2202	178	10987	133.00	0.0000	0	0.0	1006.00	3780.00	0
57	36	38	158	0	4158	1692	0	0	94	0	348	0	6524	36.00	38.0000	158	0.0	4158.00	1692.00	0
58	2	0	0	0	1656	3883	376	0	1809	30	1681	0	9437	2.00	0.0000	0	0.0	1656.00	3883.00	376
59	2911	33	744	13509	8024	932	95049	759	0	91	5400	1868	129320	3109.65	33.0000	744	13463.6	7997.05	928.87	95049
60	2309	27	289	637	143	1276	1	0	32	377	2418	39	7548	2811.11	94.2828	289	615.7	138.23	1233.40	1

BASNO	NFWET85	QUARRY85	TRANS90	AG90	WATER85	TOT90	RESOTH00	COMMER00	INTIC00	DF00	EF00	MF00	FWET85	NFWET85	QUARRY85	TRANS00	AG00	WATER85	TOT00
55	0	1478	0	3368.87	0	11277	708.54	77.000	0	0.0	805.55	4800.54	67	0	1478	0	3340.38	0	11277
56	0	3671	17	2202.00	178	10987	133.00	0.000	0	0.0	1006.00	3780.00	0	0	3671	17	2202.00	178	10987
57	0	94	0	348.00	0	6524	36.00	38.000	158	0.0	4158.00	1692.00	0	0	94	0	348.00	0	6524
58	0	1809	30	1681.00	0	9437	2.00	0.000	0	0.0	1656.00	3883.00	376	0	1809	30	1681.00	0	9437
59	759	0	0	5367.81	1868	129320	3576.39	33.000	744	13267.2	7880.35	915.32	95049	759	0	0	5227.78	1868	129320
60	0	32	0	2294.25	39	7548	3990.88	252.372	289	491.1	110.24	983.71	1	0	32	0	1358.71	39	7548

BASNO	RESOTH10	COMMER10	INTIC10	DF10	EF10	MF10	FWET85	NFWET85	QUARRY85	TRANS10	AG10	WATER85	TOT10	RESOTH20	COMMER20	INTIC20	DF20
55	763.08	77.000	0	0.0	801.43	4775.98	67	0	1478	0	3314.51	0	11277	814.55	77.000	0	0.0
56	133.00	0.000	0	0.0	1006.00	3780.00	0	0	3671	17	2202.00	178	10987	133.00	0.000	0	0.0
57	36.00	38.000	158	0.0	4158.00	1692.00	0	0	94	0	348.00	0	6524	36.00	38.000	158	0.0
58	2.00	0.000	0	0.0	1656.00	3883.00	376	0	1809	30	1681.00	0	9437	2.00	0.000	0	0.0
59	4000.68	33.000	744	13088.2	7774.08	902.97	95049	759	0	0	5101.03	1868	129320	4401.09	33.000	744	12919.1
60	5063.32	396.079	289	351.7	78.95	704.47	1	0	32	0	592.50	39	7548	6075.44	531.703	289	179.7

BASNO	EF20	MF20	FHET85	NFHET85	QUARRY85	TRANS20	AG20	WATER85	TOT20	RESOTH30	COMMER30	INTIC30	DF30	EF30	MF30	FHET85	NFHET85	QUARRY85
55	797.53	4752.78	67	0	1478	0	3290.13	0	11277	856.85	77.000	0	0.0	794.33	4733.69	67	0	1478
56	1006.00	3780.00	0	0	3671	17	2202.00	178	10987	133.00	0.000	0	0.0	1006.00	3780.00	0	0	3671
57	4158.00	1692.00	0	0	94	0	348.00	0	6524	36.00	38.000	158	0.0	4158.00	1692.00	0	0	94
58	1656.00	3883.00	376	0	1809	30	1681.00	0	9437	2.00	0.000	0	0.0	1656.00	3883.00	376	0	1809
59	7673.62	891.30	95049	759	0	0	4981.89	1868	129320	4730.15	33.000	744	12779.9	7590.92	881.70	95049	759	0
60	40.33	359.87	1	0	32	0	0.00	39	7548	6253.97	555.626	289	116.9	26.25	234.22	1	0	32

BASNO	TRANS30	AG30	WATER85	TOT30	RESOTH40	COMMER40	INTIC40	DF40	EF40	MF40	FHET85	NFHET85	QUARRY85	TRANS40	AG40	WATER85	TOT40
55	0	3270.12	0	11277	900.91	77.000	0	0.0	790.99	4713.80	67	0	1478	0	3249.30	0	11277
56	17	2202.00	178	10987	133.00	0.000	0	0.0	1006.00	3780.00	0	0	3671	17	2202.00	178	10987
57	0	348.00	0	6524	36.00	38.000	158	0.0	4158.00	1692.00	0	0	94	0	348.00	0	6524
58	30	1681.00	0	9437	2.00	0.000	0	0.0	1656.00	3883.00	376	0	1809	30	1681.00	0	9437
59	0	4884.35	1868	129320	5072.85	33.000	744	12634.7	7504.69	871.68	95049	759	0	0	4783.08	1868	129320
60	0	0.00	39	7548	6253.97	555.626	289	116.9	26.25	234.22	1	0	32	0	0.00	39	7548

LAND USE ANALYSIS

Historical land use for 1954, 1972, 1978, and 1985 are shown in Tables 3, 4, 5, and 6 of the main report. A geographic information system (GIS) was used to map historical land use changes. The methodologies used to map historical land use and project future land use are described in this appendix.

The hydrologic and hydraulics, land use and economic analyses were conducted on a subbasin level. The land use analysis was to determine the extent of induced development that may occur as a result of implementation of a flood control project. It was assumed that the major impacts would be limited to those areas within the basin where alternative plans would cause substantial stage lowerings (greater than 1 foot) or areas where the floodplain would change measurably. The following subbasins were analyzed in the Comite River Basin.

SUBBASIN NUMBER	SUBBASIN NAME
1	Bayou Baton Rouge
2	Upper Cypress Bayou
3	Upper White Bayou
4	Redwood Creek
5	Comite River above Redwood Creek
6	Lively Bayou
7	South Canal & Cypress Bayou
8	Comite River Vicinity of Dyer Road
9	Baker and South Canal
10	Cypress Bayou
11	Cypress Bayou Extension
12	White Bayou
13	Blackwater Bayou
14	Beaver Bayou
15	Monte Sano Bayou
16	Hurricane Creek
17	Comite River vicinity Jones Creek
18	Comite River Near Shoe Creek
19	Comite River Near Draughn Creek

The data indicates that between 1972 and 1978 about 51 percent of the urban growth occurred within the 100 year floodplain at the expense of agricultural and forest lands. Between 1978 and 1985 about 42 percent of the urban growth occurred within the 100 year floodplain. Over the longer period 1972- 1985 urban development within and outside the floodplain grew at about the same rate.

Subbasins along the Amite River where stage lowerings were about a foot or less and were considered in the analysis are shown below.

SUBBASIN NUMBER	SUBBASIN NAME
29	Bayou Fountain
31	Clay Cut Bayou
32	Lower Ward Creek
42	Amite River Diversion Canal
43	Muddy Creek
44	Amite River at Port Port
47	Amite River below Denham Springs
48	Honey Cut Bayou
51	Upper Amite River
60	Bayou Manchac

In these subbasins along the Amite River, most of the urban growth has been outside the 100 year floodplain. Data on urban growth between 1972 and 1985 is shown below.

PERCENT LAND USE CHANGES IN SELECTED SUBBASINS IN THE STUDY AREA

1972-1978		1978-1985		1972-1985	
Within 100 Year Fldplain	Outside 100 Year Fldplain	Within 100 Year Fldplain	Outside 100 Year Fldplain	Within 100 year Fldplain	Outside 100 year Fldplain
34	66	30	70	32	68

Historical data indicate that the development has occurred in the Comite River Basin without regard to location of the 100 year floodplain. The location of the 100 year floodplain has not been major factor in determining where development occurred. The Comite River Basin based on the future land use projection will not be a major growth area because transportation routes are not well developed and the area is quite a distant from major employers. Urban acres in subbasins 1- 19 are expected to increase by about 11,000 by the year 2040. The increase of about 11,000 is only 13 percent of the total growth of the area. In the subbasins along the Amite River, urban acres are expected to increase by about 33,000 acres by the year 2040. This increase is

about 41 percent of the total growth of the area. The total number of acres converted to urban lands within a subbasin would not change with the implementation of a flood control project. No reallocation of urban growth from one basin to another would occur. The implementation of the Comite River Diversion Plan would result in about 8,100 acres being removed from the 100 year floodplain within the Comite River Basin. In the study area about 13,000 acres would no longer be within the 100 year floodplain. This is only about 4 percent of the total number of acres located within the 100 year floodplain.

In the studies that were conducted by LSU Remote Sensing Laboratory and the State Planning Office, the plan designations are not the same as those contained the other parts of this report and EIS. The plans were originally designated on the basis of a level of protection. However, this is misleading because the levels of protection vary at different location for each plan. To avoid confusion, the plan designations were changed. The new designations are given below

OLD DESIGNATION	NEW DESIGNATION
10 YR Comite River Diversion	12,700 cfs Diversion
25 YR Comite River Diversion	19,600 cfs Diversion
50 YR Comite River Diversion	31,500 cfs Diversion
100 YR Comite River Diversion	41,000 cfs Diversion
10 YR Channel Modification	24,500 cfs Channel Modification
25 Yr Channel Modification	32,500 cfs Channel Modification
50 Yr Channel Modification	42,000 cfs Channel Modification
100 yr Channel Modification	51,000 cfs Channel Modification

FINAL REPORT

Historical Land-Cover Change Mapping
for Floodplain Management Within
the Amite River Basin, Louisiana
(RSIP T.R. 3.01.87)

by

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TABLE OF CONTENTS

Historical Land-Cover Change Mapping for Floodplains Management Within the Amite River Basin, Louisiana

1. INTRODUCTION

Numerous areas along the Amite River Basin, Louisiana, have experienced costly flooding in recent years. The U.S. Army Corps of Engineers (COE) is investigating the feasibility of providing improvements for flood control in the Amite River Basin. This project was conducted in order to map land-cover changes (1954/61-85) by sub-basin within the Amite River watershed that is under study by the Corps of Engineers (Figure 1).

Engineers and managers on a nationwide and worldwide basis need to better acquire, organize, and manipulate environmental data for decision making purposes. A Geographic Information Systems (GIS) is a computerized system for processing geographic and/or mapped data. A GIS should be capable of processing a variety of pertinent data including points, maps, lines, textual, and aircraft or satellite derived information (Hill et al., 1983). GIS's have been developed and utilized in numerous industrial and government installations and many are summarized in Harlow (1980).

A primary capability of a GIS is to combine or overlay maps. Such uses may be to determine soil types in forested areas, that if cleared would have the least effect on flooding down stream. It is, therefore, an excellent tool to manipulate data to spatially generate site suitability maps. Probably, one of the most significant applications of a GIS is its use when merged as a data input device to environmental (engineering) simulation models. A GIS has the capability of converting information normally available to a modeler from mapped data into one dimensional (i.e., river characteristics) and two dimensional arrays (i.e., drainage basin characteristics) through digital data processing (Dantin et al., 1981).

Numerous models are not structured to accept study area characteristics directly. Characteristics such as slope, or soil type are typically averaged manually prior to input to the model as coefficients or sub-basin characteristics. The University of Maryland has conducted extensive research using GIS's to operate several hydrologic models (Ragan and Fellows, 1981). Of particular advantage of a GIS over a more traditional manual system is the ability to rapidly design alternations and view the results for analysis purposes.

Simulation of basin hydrology requires the use of spatially oriented data representing geomorphologic, climatologic, land-use, soil, and streamflow characteristics. Such data can not generally be used in the acquired format for they are not necessarily collected for the purpose of hydrologic modeling alone. A second problem is that existing data are rarely sufficient. For instance, geomorphologic data (including channel network characteristics) are usually acquired through manual interpretation of topographic maps. As mentioned earlier, the merging of data sets to acquire such hydrologic descriptors as SCS curve number are usually manually computed. The use of a GIS can greatly speed up this process of spatial data assimilation. The application of remotely sensed, mapped data, in combination with GIS technology to solve hydrologic data collection problems has been clearly demonstrated (Woodley et al., 1981; Hill et al., 1983; Ragan and Fellows, 1981; Eidenshink and Wehde, 1982).

The Remote Sensing and Image Processing Laboratory (RSIP), Louisiana State University had already constructed a digital data base of a portion of the Amite River Basin (Hill, et al., 1987). This data base was designed to demonstrate how a Geographic Information System (GIS) could be constructed to assist in data assimilation associated with the management of a floodplain. The data base was created in support of data requirements by a hydrologic model designed to predict the runoff hydrograph from ungaged basins. The GIS was used to digitally and spatially generate an integrated Soil Conservation Service (SCS) curve number for the portion of the basin understudy. To this end, soil associations and land-use (generated from analysis of Landsat satellite data) were merged in the GIS to acquire a map representing SCS runoff curve numbers. The volume of runoff obtained form the Watershed Hydrology Simulation (WAHS) Model (Singh, 1983) using this map was compared to the volume computed by hydrograph separation and found to be accurate within 19 percent. To demonstrate the effect of changing land-use on basin hydrology, the GIS was used to vary percentages from the drainage area from forest to bare soil. By changing basin runoff curve numbers, significant changes in

peak discharge were noted. The spatial map created by the GIS could be used by engineers and/or managers to easily, spatially change land-use at various locations across a basin and determine specific resulting impacts. The GIS capability eliminated many of the more traditional manual phase of data input and manipulation, thereby allowing researchers to concentrate on the development and calibration of the model and interpretation of presumably more accurate results.

With previous experience concerning available data sets representing the Amite River Basin and a GIS capability, RSIP proceeded to generate the data base and results described in the report. The remainder of this report describes the construction of the GIS and generation of results.

2. MATERIALS AND METHODS

This section describes the various data sources, methods of photointerpretation, digitization, data base creation, and generation of results from GIS analysis procedures.

2.1. Data Sources

The original data sources for this project consist of maps and aerial photographs detailing drainage basins, parish boundaries, soil associations, and land use/land cover types for three separate years. Each specific data set is described in the following sections.

2.1.1. Drainage Basins

The COE provided 1:62,500 U.S. Geological Survey (USGS) maps (paper format) on which they outlined 60 sub-basins within the study area.

2.1.2. Parish Boundaries

Parish boundaries were derived from the above mentioned 1:62,500 USGS maps.

2.1.3. Soil Associations

A digital map of soil associations was acquired from the Computer Aided Design/Geographic Information Systems (CAD/GIS) Laboratory at LSU. This map had been generated by the Soil Conservation Service (SCS), U.S. Department of Agriculture (USDA). These are fairly generalized maps with an original minimum mapping resolution of 640 acres. While generalized, detailed parish soil maps are still in preparation by the SCS and the data used were the only available contiguous soils data of the study area. Table 1 represents the SCS soil associations which were mapped within the study area.

2.1.4. Land Use/Land Cover

Time, funding, and available data were important factors in the selection of land cover data sets. The earliest source of land cover data used was a 1954 (updated in 1961) USGS map at a scale of 1:250,000. It was formally entitled the "Baton Rouge" map. This map distinguishes the following categories of land cover, water forest, forested wetland, non-forested wetland, cleared land, and urban built-up land. This map was updated in 1961, meaning that urban areas were updated, but that surrounding areas were probably not and, therefore, represent 1954 conditions. A mylar map could not be acquired in a timely manner from the USGS, so a paper map was used to abstract (copy) this particular data set.

The USGS mapped 1978 land cover conditions using high altitude color infrared aerial photography (scale; 1:65,000; acquired in October 1978 by the U.S. Environmental Protection Agency (EPA)). USGS Level 2 land cover categories (Anderson et al., 1976) were mapped for 1978 (Table 2).

The minimum mapping unit for the 1978 land cover was originally 10 acres for urban categories and 40 acres for all remaining natural categories. These data were mapped at an original scale of

Table 1. SCS soil associations which were mapped in the Amite River Basin study area.

4-	Acy-Essen-Jeanerette
10-	Barbary-Fausse
30-	Calhoun
31-	Calhoun-Cascilla
34-	Calhoun-Olivier
36-	Cascilla-Ochlockonee
38-	Commerce
46-	Convent
55-	Deerford-Verdun-Frost
355-	Deerford-Verdun-Jeanerette
56-	Dexter-Calhoun
361-	Dundee-Baldwin
74-	Galvez-Commerce
95-	Hydraquents-Haplaquepts
130-	Memphis-Loring
132-	Mhoon-Commerce
147-	Olivier-Loring-Calhoun
448-	Olivier-Providence
160-	Providence-Lexington
177-	Sharkey
184-	Sharkey-Fausse
186-	Sharkey-Mhoon-Crevasse
189-	Sharkey-Tunica
208-	Water

1:250,000 (Baton Rouge quadrangle). This same strategy was selected to map the 1985 land cover so that a meaningful comparison could be derived for change between the two dates. RSIP also had a copy of the 1978 imagery and used it when there were occasional questions about the USGS's interpretation.

The source for 1985 land cover was high-altitude, color infrared photography acquired 14-15 December, 1985 by the National Aeronautics and Space Administration (NASA) as part of its Airborne Instrumentation Research Project. This imagery was at a scale of 1:62,000 and was, therefore, similar in many ways to that used by the USGS for the 1978 land cover data set. High quality roll-to-roll duplicate transparencies of the study area imagery were made by Precision Photo Laboratories of Dayton, Ohio. Every frame was duplicated to ensure that only the least distorted/best exposed center areas of each photograph would be interpreted for mapping purposes. The rolls were cut into individual frames for ease of handling.

2.2. Photointerpretation

Photointerpretation is both the art and science of deriving data from aerial imagery. The primary goal of this project was to update the 1978 USGS land cover map for the southern portion of the Amite River Basin. It was first necessary to devise a system of reference for accurately registering the photographs to the maps. The mylar 1978 USGS (1:250,000) land cover map was photographically enlarged (vacuum framed) to a scale of 1:62,500 so as to closely match the approximate scale of the photography. The USGS map only represented land cover polygons and, therefore, was lacking in photo-to-map registration features (i.e., roads, rivers). It was decided to also photographically (vacuum frame) copy the 1:62,500 USGS maps with numerous registration points onto a mylar (translucent) base. The enlarged 1978 land cover map was cut so that each piece corresponded with the associated 1:62,500

Table 2. Abbreviated land use and cover classification systems for USGS Levels I and II (Anderson et al., 1976)

Level I	Level II
1. Urban or built-up land	11. Residential
	12. Commercial and services
	13. Industrial
	14. Transportation, communications, and utilities
	15. Industrial and commercial complexes
	16. Mixed urban or built-up land
	17. Other urban or built-up land
2. Agricultural land	21. Cropland and pasture
	22. Orchards, groves, vineyards, nurseries, and ornamental horticultural areas
	23. Confined feeding operations
	24. Other agricultural land
3. Rangeland	31. Herbaceous rangeland
	32. Shrub and brush rangeland
	33. Mixed rangeland
4. Forest land	41. Deciduous forest land
	42. Evergreen forest land
	43. Mixed forest land
5. Water	51. Streams and canals
	52. Lakes
	53. Reservoirs
	54. Bays and estuaries
6. Wetland	61. Forested wetland
	62. Nonforested wetland
7. Barren land	71. Dry salt flats
	72. Beaches
	73. Sandy areas other than beaches
	74. Bare exposed rock
	75. Strip mines, quarries, and gravel pits
	76. Transitional areas
	77. Mixed barren land

quadrangle. This combination of cultural and hydrologic feature line-work and land cover polygons assured the best registration of photographs to maps. A Kargl reflecting projector, which makes scale changes between different photographic frames and allows for geometric adjustments for anterior and lateral tilt of the imagery, was used for photo-to-map transfer.

Each 15 minute (1:62,500) quadrangle was updated as a unit by a specific photointerpreter for efficiency and product control purposes. The photographs were sequentially mounted and registered, and only updated (change) land cover polygons were traced on a separate herculene sheet overlaying the 1978 land cover and topographic maps. Once registered, the topographic map was often removed to obtain a clearer image. After one of the two photointerpreters had finished updating a quadrangle, it was edited by the other interpreter with mutual discussions regarding changes where necessary. Areas where land cover could not be determined were temporarily labeled "unknown". Land cover for these relatively few areas was determined during a low altitude overflight of the area(s). This flight occurred on 15 June 1987. Upon verification, questionable polygons were updated where necessary.

Any photointerpretation project concerning the mapping of manmade and particularly natural features encounters difficulties in classification and accuracy. This section describes the opportunities for compromise and the reasons for making such decisions throughout this project. All decisions were made jointly with the COE.

1) **Forest Types.** RSIP interpreters found that the mapping of forest units by the USGS seemed less accurate than the mapping of urban or agricultural units. Although the standard mapping unit for forests is 40 acres, large tracts of forest containing small individual stands of deciduous, evergreen, and mixed association tended to be mapped as one large unit. This project was primarily concerned with updating the 1978 map, and not with a critique or revision of USGS photointerpretation and land use classification practices. However, in the interests of evaluating the reliability of their forest classification in the Amite River Basin, an accuracy test for USGS mapping of forest types was devised.

During aerial ground truthing, a series of forest areas were examined by the interpreters with the goal of verifying the correspondence between photographic tones and textures and actual forest types. This review enabled the interpreters to be reasonably certain of the accuracy of their classification of the infrared photographs. The December 1985 imagery was excellent data for the verification of the 1978 (October, leaves on) imagery (map) used by the USGS. Being December, leaves were basically off the deciduous trees and the 3 major forest categories (pine, deciduous, mixed) were relatively easily discriminated. A group of 250 points was randomly generated on a map of the Amite River Basin, a number large enough to ensure that at least 100 forest polygons would be intersected. The forest type for each of the 122 points that happened to fall in a forest was determined from examination of the 1985 photographs by the two interpreters. A confusion matrix comparing the findings of the photointerpreters and the USGS is provided in Table 3.

Table 3. Confusion matrix comparing RSIP versus USGS forest interpretations.

VERIFIED		41	42	43	61
L					
A	41	27	0	3	0
B	42	0	11	7	1
E	43	5	2	20	0
L	61	0	0	4	36

The overall level of accuracy obtained in this sample is 81%, with an upper confidence limit of 88% and a lower confidence limit of 74% at a 95% level of confidence. The USGS standards for accuracy prescribe 85% overall agreement, but not necessarily within individual categories. This sample indicates that their mapping of forest units was probably slightly less accurate than is usual. Most of the discrepancy can be attributed to over-generalization on the part of USGS who apparently chose to delineate larger mapping units than required given the 40 acre mapping limit.

2) **Clearcuts.** The conventional USGS classification of clearcuts in forested land is to consider them forest. While this category accurately fits their former (and probably future) land cover it does not reflect their current status in terms of wildlife habitat and run-off characteristics. Because this study seeks to identify change between 1978 and 1985, it would be misleading to classify 1985 clearcuts into a category separate from forest. Hence, the updated 1985 map merges clearcuts into the forest category. However, a separate map and a table of acreages could later be produced to provide information on the extent and location of forest clearcuts. This was done upon request of the COE and the U.S. Fish and Wildlife Service (USFWS).

2.3. GIS Development

Numerous tasks are performed in the production of a GIS. These include the 1) digitization of photointerpreted maps, 2) plotting and editing of these products, 3) conversion of these line (vector) based maps into pixel (raster) format, 4) map overlay and data processing using the GIS, and 5) final product generation (i.e., text, maps, slides). All data processing was performed at the Remote Sensing and Image Processing Laboratory (RSIP), Louisiana State University (LSU). The NASA developed ELAS software was used to perform most of the data processing for this project. ELAS is an interactive image analysis and GIS system which has been implemented and further modified by RSIP. These various tasks are described briefly in the next subsections of this report.

2.3.1. Map Digitizing

Six digital map sets were produced during the course of this project, and these include parish boundaries, basin boundaries, soil associations, and 1954, 1978, and 1985 land use. All data but the 1978 land use data were digitized on an Intergraph computer mapping system. The 1978 land use data were derived from USGS GIRAS format digital data (Fegeas et al., 1983). These data were digitized by the USGS from 1:250,000 mylar land use maps and converted to Intergraph format.

Map digitizing on the Intergraph system was done using the following procedure. Materials to be digitized were first mathematically tied to the data file by selecting points on the maps for which coordinates are known. This setup procedure minimized distortions in the source map caused by shrinkage or stretching of the map material. These points were typically, but not necessarily, located at map cornerpoints. The accuracy of map registration was inspected after setup to insure that control points were properly located.

Next, X and Y coordinates for the linework were entered into the system by an operator who traced map features using a cursor connected to an X-Y digitizing table. The resulting linework was then edited by a computer program for overlapping lines or gaps and converted to unique polygons and appropriately labeled. Plots were then produced and overlain on the original map and checked for incorrect labeling or digitization. After the digitized maps had been verified, they were converted from the Intergraph vector-based format to the ELAS (Earth Resources Laboratory Applications Software; NASA, 1980) raster format of analysis. GIS and Data Processing

Once the maps are digitized, they need to be input and overlain in a GIS. Once in the GIS, they can be merged and/or analyzed. The polygon data digitized using the Intergraph system were converted to raster data files using the ELAS module PUDR. PUDR is a vector to raster conversion program that generates a gridded data set with a specified cell size. The cell size chosen for this study was 50 m. Two standard ELAS modules, PLYA and TLYX were used for measuring areas and mapping change. In addition, RSIP programmers modified TLYX to produce two additional programs, TLYM and TLMM. PLYA was used to measure basin-wide areas of different classes such as soil types, land cover, and basins. TLYX, TLYM and TLMM tabulate co-occurrences of data values in 2, 3, and 4 data channels, respectively. These modules were used for calculations such as land cover change by subbasin and by soil association.

The method by which the GIS is used to manipulate maps is graphically represented in Figure 2. Table 4 represents the basin parameters which were used to generate acreage estimates found in the Appendix.

2.3.2. Final Product Generation

Output products were in three forms, tables of areas, 35 mm slides and pen-plotter output. Tabular output was generated by the ELAS modules described above and reformatted to improve readability. Color slides of ELAS data files were generated using a MATRIX camera attached to RSIP International Imaging Systems display. Pen plots at a scale of 1:62,500 were produced using the Intergraph plotting software and a Hewlett-Packard pen plotter. Rough copies were first plotted on paper for cartographic editing, final plots were produced using high quality drafting film and permanent ink. Map labels

Table 4. Basin parameters used for generating acreages.	
1)	Basin area
2)	Sub-basin areas
3)	Parish areas
4)	Soil association areas
5)	Basin land cover, 1954
6)	Basin land cover, 1978
7)	Basin land cover, 1985
8)	Land cover change, 1954-1978
9)	Land cover change, 1978-1985
10)	Soils by parishes
11)	Land cover by parish, 1954
12)	Land cover by parish, 1978
13)	Land cover by parish, 1985
14)	Land cover change by parish, 1954-1978
15)	Land cover change by parish, 1978-1985
16)	Land cover by sub-basin, 1954
17)	Land cover by sub-basin, 1978
18)	Land cover by sub-basin, 1985
19)	Land cover change by sub-basin, 1954-1978
20)	Land cover change by sub-basin, 1978-1985
21)	Land cover by soil by sub-basin, 1954
22)	Land cover by soil by sub-basin, 1978
23)	Land cover by soil by sub-basin, 1985

generally followed standards set by the USGS.

Portions of 11, 1:62,500 maps were generated for each map type (i.e., land-cover, soils) of the study area (Table 5). Where extremely small portions of maps were interpreted, they were added to the plot of the neighboring full map quadrangle (9 total 1:62,500 maps). Parish boundaries were not plotted separately because they are present on the standard 1:62,500 USGS quadrangles (1:62,500) to be used as base maps on which to overlay the maps generated by this project.

Table 5. Base maps for which overlays were generated.	
1)	Felixville
2)	Zachary
3)	Pine Grove
4)	Baton Rouge
5)	Denham Springs
6)	Springfield
7)	White Castle
8)	Donaldsonville
9)	Mount Airy

Five large scale plots were generated of each map type for use as an index of the 1:62,500 maps. Table 6 represents the maps that were plotted and presented to the COE as final products of this project. For presentation purposes, color slides were generated to depict the data processed as part of this project.

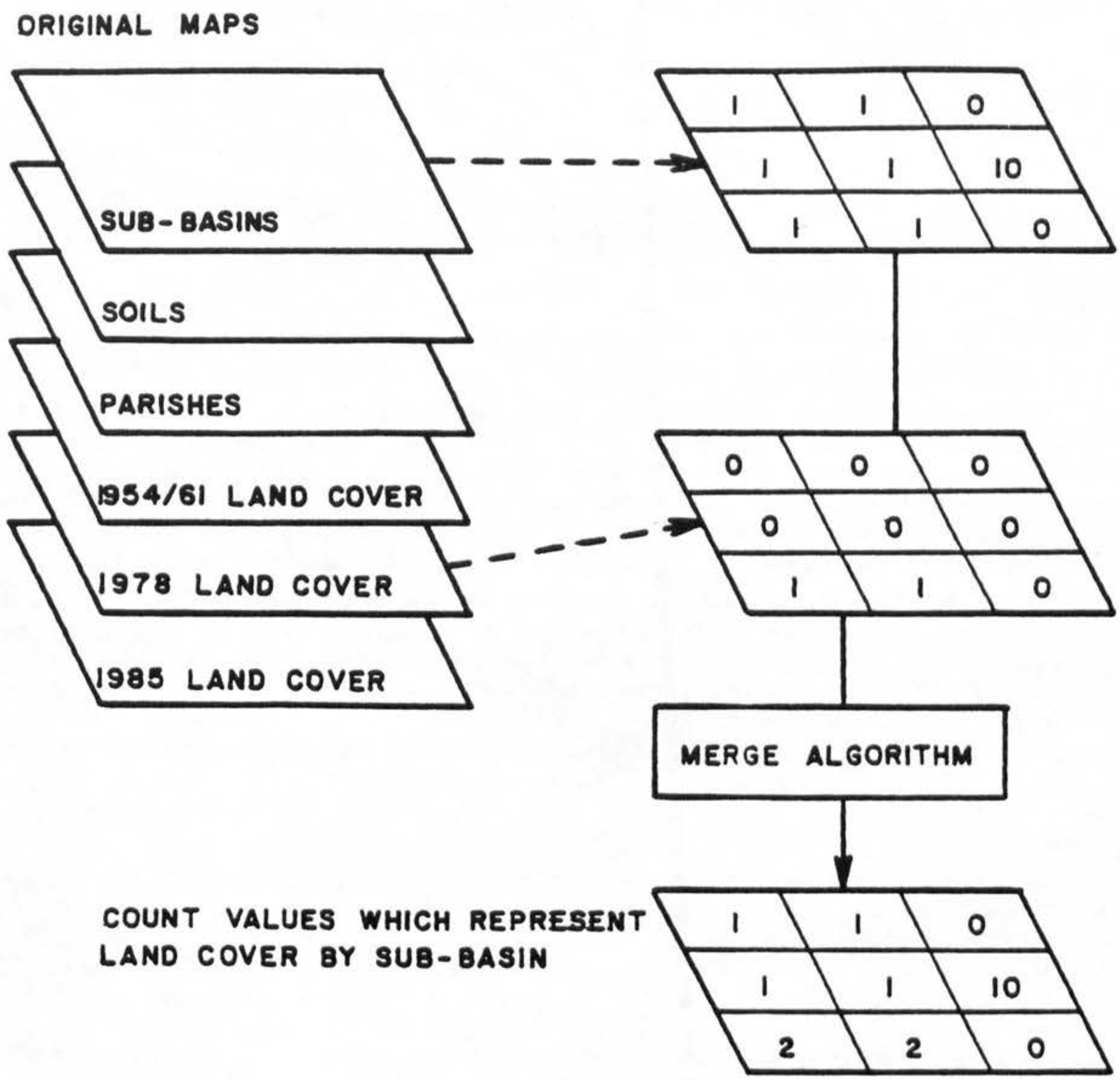

Fig. 2. Flow chart describing the use of a GIS to merge mapped data.

Table 6. Final maps generated as results of this project for the Amite River Basin study area.

Map Type		Scale(No.)	1:62,500
1	Sub-Basins	1	9
2	Soil Associations	1	9
3	1954/61 Land Cover	1	9
4	1978 Land Cover	1	9
5	1985 Land Cover	1	9
	Total Maps	5	45

3. RESULTS AND RECOMMENDATIONS

The results of this project take the form of tables, maps, and slides. The tables representing various acreage figures by basin parameter are found in the Appendix. They are found in the order as outlined in the GIS Development and Data Processing Section (2.3.2) of this report. Aside from the 1985 land cover update map of the 1978 USGS information (map), only existing data (maps) were used for all phases of this project. Numerous data sources at varying scales and categories were merged to generate the final products. Therefore, it is appropriate to present a brief discussion of selected data sets.

The 1978 USGS mapped data did not exactly overlay onto the 1:62,500 USGS maps as well as anticipated. This is not an error, the map was generated from a digital tape produced by the USGS and was simply within the mapping accuracy of their land-cover maps at a original scale of 1:250,000. The 1978 to 1985 land-cover change data is deemed to be accurate within the mapping resolutions used in this project. The original 1954/61 USGS map only represented four very generalized land cover categories, at a gross mapping resolution, and two dates (1954 and 1961). A comparison test was run between these two sets, and the 1954 to 1978 analysis resulted in some unique land cover changes (i.e., urban to forest or wetlands). The 1954 to 1978 land-use change data should be used with these considerations in mind.

Several recommendations are proposed if further data analysis is required by the COE for the Amite River Basin study area. The detailed SCS soil series maps should be entered into the GIS as they are made available. A few are presently complete. The COE has generated numerous other detailed data sets of the Amite study area (i.e., 2 foot contours, building locations). These data should also be added to the GIS. There is also an Environmental Impact Statement (EIS) being conducted for the proposed Darlington Reservoir. Numerous maps (i.e., wildlife habitats, archeological sites) are likely to be generated through this EIS. These too should be input to the GIS. It is recommended that these future maps be standardized where they could be relatively easily input to a GIS.

The COE and associated Louisiana state agencies will be involved with various aspects of the Amite River Basins for years to come. The proposed GIS could then be used to accurately and cost effectively generate numerous scenarios (i.e., land use change, flood damage assessment by contour). The GIS could be further used by the COE and agencies to develop, test and/or calibrate numerous other water simulation models (i.e., SLOSH, floods) that could and should be introduced as planning tools within the COE district and state.

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APPENDIX A

TABLES OF ACREAGES

APPENDIX B

Sub-Basin Names in the Southern Amite River Basin

Sub-Basin Number	Basin Name
1	Bayou Baton Rouge
2	Upper Cypress Bayou
3	Upper White Bayou
4	Redwood Creek
5	Comite River Above Redwood Creek
6	Lily Bayou
7	South Canal & Cypress Bayou
8	Comite River Vicinity of Dyer Rd.
9	Baker and South Canal
10	Cypress Bayou
11	Cypress Bayou Extension
12	White Bayou
13	Blackwater Bayou
14	Beaver Bayou
15	Monte Sano Bayou
16	Hurricane Creek
17	Comite River Vic. of Jones Bayou
18	Comite River Near Shoe Creek
19	Comite River Near Draughan Creek
20	Capital Lake
21	Upper Ward Creek
22	Jones Creek
23	Lively Bayou Tributary
24	Lively Bayou
25	Bayou Duplantier
26	Upper Dawson Creek
27	North Branch of Ward Creek
28	Weiner Creek
29	Bayou Fountain
30	Lower Dawson Creek
31	Claycut Bayou

APPENDIX B (Continued)

Sub-Basin Names in the Southern Amite River Basin

Sub-Basin Number	Basin Name
32	Lower Ward Creek
33	Bayou Braud and Spanish Lake
34	Upper New River
35	Grand Goudine
36	New River Vic. of Gonzales
37	Bayou Francois
38	Bayou Conway
39	Bayou Narcisse
40	Lower Black Bayou
41	Black Bayou Vic. of Duplessis
42	Amite River at Diversion Canal
43	Muddy Creek
44	Amite River at Port Vincent
45	Colyell Bay and Creek
46	Lower Grays Creek
47	Amite River Below Denham Springs
48	Honey Cut Bayou
49	Millers Canal
50	Upper Grays Creek
51	Upper Amite River
52	Beaver Creek
53	Upper Beaver Creek
54	Amite River at Denham Springs
55	Amite River at Greenwell Springs
56	Amite River Vic. of Baywood
57	Pigeon Creek
58	Amite River at Bluff Creek
59	Lower Amite River
60	Bayou Manchac

FINAL REPORT

Land-Use and Floodplain Trend
Analysis of the Southern Amite River Basin: 1972-1985
(RSIP T.R. 3.01.88)

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TABLE OF CONTENTS **PAGE**

Land-Use and Floodplain Analysis of the Southern Amite River Basin: 1972-1985

1.0 INTRODUCTION

The U.S. Army Corps of Engineers (COE) is conducting a study to investigate the feasibility of providing flood protection for the residents in Amite River Basin. This project was conducted with the primary objective of providing acreage estimates of historic land-use trends within the limits of various floodplain boundaries for the southern portion of the Amite River Basin, Louisiana. Data from this report are to be used to help asses the impacts of alternative plans on future land-use in the basin. The COE, under a previous contract (Hill, et al 1987), had the Remote Sensing and Image Processing Laboratory (RSIP) Louisiana State University (LSU) build a computerized Geographic Information System (GIS) consisting of 1954, 1978, and 1985 land-use data, soil associations, sub-drainage basins, and parish boundaries. For this contract a 1972, U.S. Geological Survey (USGS) digital data set was added to the GIS. COE generated 100 year, 25 and 10 year floodplains were also added to the data base.

Acreage estimates of various combinations of data (i.e., land-use inside and outside each floodplain by year mapped) were generated. These data were sent to the COE for various planning activities. A reformatted data set was also sent to the Louisiana Office of State Planning for use in helping the COE estimate potential urban growth trends by sub-basin.

2.0 MATERIALS AND METHODS

The sources of 1954, 1972, 1985 land-use, soil associations, sub-drainage basins, and parish boundaries is found in Hill, et al 1987. This section will describe only the new sources of data entered into the existing GIS under this project and include map digitization and generation of results.

2.1 Data Sources

The original data sets for this particular project consisted of 1972 land-use / land cover and floodplain maps. Each specific data set is described in the following sections.

2.1.1 1972 Land Use / Land Cover

The Louisiana Office of State Planning had a USGS mapped 1972 land cover data set on a digital tape. The exact format and condition of the data was unknown. RSIP transferred, reformatted, visually reviewed, and found the data to be useful. The individual polygons were not labeled and had to be manually input to the digital map using a 1972 reference mylar map (scale; 1:250,000) also provided by the Office of State Planning.

There were two primarily differences between this 1972 USGS generated map from the earlier processed 1978 and 1985 data sets. First, the 1972 polygon borders consisted of straight lines and squared off corners. The later maps (1972 and 1985) consisted of more rounded polygons. While exact polygon boundaries did not overlay exactly, the relative acreage estimates and associated changes are useful information. The 1972 data was originally photointerpreted using leaf-off imagery. It was mapped at a scale of 1:250,000 (Baton Rouge quadrangle). Generally, the urban areas were mapped at a spatial resolution (minimum mapping unit) of 10 acres and all other land-cover categories were mapped at 40 acres or greater.

Second, the USGS used a bit different land-use / land cover classification scheme for the 1972 data set. The Louisiana Office of State Planning (Personnel communications with Mr. Glen Daigre)

developed a scheme to standardize the 1972 to the existing 1978 and 1985 categories. The plan as approved by the COE is as follows:

1. The '72 category 14 is "Extractive". For the Baton Rouge area most of this is gravel pits. Therefore, the category 14 should be renumbered as 75. Some data distortion is to be expected because oil fields came under this category in "72. However, within the study area for this project this distortion should be minimal.
2. The '72 category 75 is "Other". This should convey to the "78 category 76, "Transitional".
3. The '72 category 15 should be renumbered as 14. Some distortion will also be noted here as the criteria for mapping these areas were changed between '72 and '78.
4. There was no equivalent for the '78 category category 15, "Industrial and Commercial Complexes" in the '72 data.
5. The '72 category 16, "Institutional" should be grouped with the category 12 because the '78 definition of "Commercial and Services" includes institutional uses.
6. Both '72 categories 17, "Strip and Clustered Settlement" and 18, "Mixed" should be grouped and renumbered as category 16.
7. The '72 category 19 is the equivalent of the '78 category 17.

Table 1 represents the USGS Level 2 land-use / land cover categories used in this report.

Table 1. Land-use / land cover categories used for all dates studied in this project.

CATEGORY NO.	DESCRIPTION
11	**Residential**
12	**Commercial and services**
13	**Industrial**
14	**Transportation, communications, and utilities**
15	**Industrial and commercial complexes**
16	**Mixed urban or built-up land**
17	**Other urban or built-up land**
20	**Agricultural land**
21	**Cropland and pasture**
22	**Orchards, groves, vineyards, nurseries, and ornamental horticultural areas**
23	**Confined feeding operations**
24	**Other agricultural land**
41	**Deciduous forest land**
42	**Evergreen forest land**
43	**Mixed forest land**
50	**Water**
51	**Streams and canals**
52	**Lakes**
53	**Reservoirs**
61	**Forested wetland**
62	**Nonforested wetland**
75	**Strip mines, quarries, and gravel pits**
76	**Transitional areas**

For the purpose of generating future land-use projections for the COE, the Office of State Planning requested the grouping of all water categories and all agricultural lands into just two categories. Two separate acreage reports were therefore generated, one for the COE and one for the Office of State Planning.

2.1.2 Floodplain Data

The COE provided 100, 25, and 10 Year Floodplain boundaries drawn on 22 standard USGS 1:24,000 quadrangles (Table 2). These three floodplains primarily differed on the resulting Baton Rouge and Zachary 1:62,500 quadrangles. When any or all of the floodplains were within approximately one eighth of an inch (200 ft.), on the original COE provided maps, they were merged into one line. The final line was located between the originally mapped lines. This was agreed on by the COE and implemented due to the complexity of boundaries and project constraints.

This project study area, encompassing floodplains, was slightly different from the original data base boundary (Figure 1). This slightly smaller study area was taken into consideration and used to generate the floodplain data associated with this report.

2.3 GIS Development

All data processing was performed at the Remote Sensing and Image Processing Laboratory (RSIP), Louisiana State University (LSU). The National Aeronautics and Space Administration (NASA) developed ELAS software was used to perform all GIS data processing functions of this project. ELAS is an interactive image analysis and GIS system which has been implemented and further modified by RSIP. The tasks utilizing the GIS are described briefly in the next subsections of this report.

2.3.1 Map Digitizing

The process of map digitizing is described in Hill, et al. (1987). The original 22, 1:24,000 floodplain maps (Table 2) were merged into portions of 11, 1:62,500 quadrangle overlays. The polygons representing the 1972 land use / land cover data were also input to the digital GIS using the Intergraph computer mapping system. Digitized and labeled polygons were compared (edited) by a separate interpretor to the original COE provided base maps. Questionable polygons were verified and/or updated where necessary. Through use of the ELAS software (Hill, et al. 1987), this data was gridded into 50m cells and overlain (registered to) on the existing Geographic Information System (GIS).

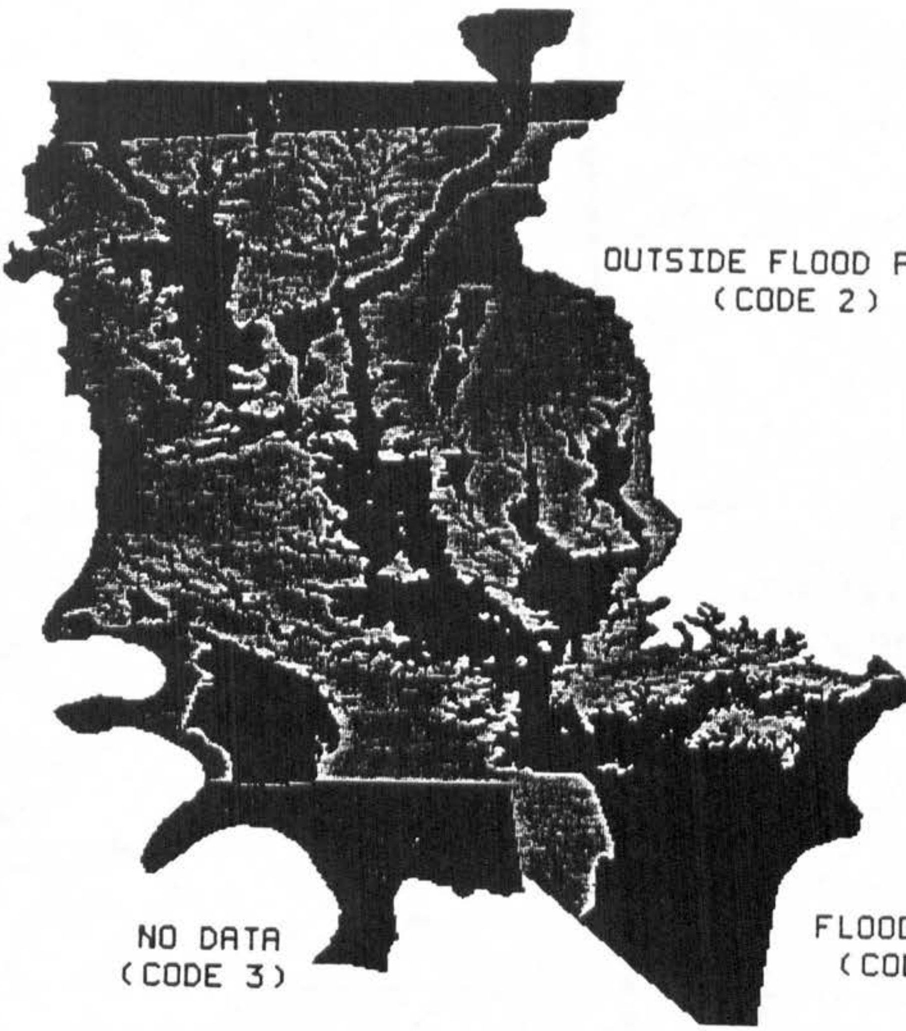

OUTSIDE FLOOD PLAIN
(CODE 2)
NO DATA
(CODE 3)
FLOOD PLAIN
(CODE 1)

Fig. 1. Graphic representation depicting the different boundaries between the original GIS and the COE provided floodplain study area.

Table 2. Topographic maps (1:24,000) used in mapping the 100, 25, and 10 Year Floodplains.

1	**Baton Rouge East, La.**
2	**Baton Rouge West, La.**
3	**Comite, La.**
4	**Denham Springs, La.**
5	**Fred, La.**
6	**French Settlement, La.**
7	**Frost, La.**
8	**Killian, La.**
9	**Mount Airy NE, La.**
10	**Mount Airy NW, La.**
11	**Pine Grove, La.**
12	**Plaquemine, La.**
13	**Prairieville, La.**
14	**Pride, La.**
15	**Satsuma, La.**
16	**Scotlandville, La.**
17	**Sorrento, La.**
18	**St. Gabriel, La.**
19	**Walker, La.**
20	**Watson, La.**
21	**Whitehall, La.**
22	**Zachary, La.**

2.3.2 Final Product Generation

Output products were in four formats: tables of areas (acreage), 35mm color slides, laser printer (8.5 by 11 inch) plots, and computer plotter generated pen plots (1:24,000 quadrangle sized overlays). Tabular output was generated by ELAS modules described in Hill, et al (1987). Tables 3 and 4 represent the basin parameters used for calculations such as land use / land cover change by subbasin by year. These acreage results for the two reports (COE and Office of State Planning) are outlined in Tables 3 and 4, respectively. Color slides of ELAS data files were generated using a MATRIX camera attached to an International Imaging System display. Pen plots at a scale of 1:62,500 were produced using the Intergraph plotting software and produced using high quality drafting film and permanent ink. Map labels generally followed standards set by the USGS.

Table 3. Land use / land cover scenarios calculated for the COE of various parameters for the dates studied in the Amite River Basin, Louisiana.

1972 Land Use

1972 Land Use by 100 Year Flood Plain

1972 Land Use by 100 Year Flood Plain and by Sub-Basin

1972 Land Use by 100 Year Flood Plain and by Parish

1972 Land Use by 25 Year Channel Modification

1972 Land Use by 25 Year Channel Modification and by Sub-Basin

1972 Land Use by 25 Year Channel Modification and by Parish

1972 Land Use by 10 Year Comite Diversion

1972 Land Use by 10 Year Comite Diversion and by Sub-Basin

1972 Land Use by 10 Year Comite Diversion and by Parish

1978 Land Use

1978 Land Use by 100 Year Flood Plain

1978 Land Use by 100 Year Flood Plain and by Sub-Basin

1978 Land Use by 100 Year Flood Plain and by Parish

1978 Land Use by 25 Year Channel Modification

1978 Land Use by 25 Year Channel Modification and by Sub-Basin

1978 Land Use by 25 Year Channel Modification and by Parish

1978 Land Use by 10 Year Comite Diversion

1978 Land Use by 10 Year Comite Diversion and by Sub-Basin

1978 Land Use by 10 Year Comite Diversion and by Parish

1985 Land Use

1985 Land Use by 100 Year Flood Plain

1985 Land Use by 100 Year Flood Plain and by Sub-Basin

1985 Land Use by 100 Year Flood Plain and by Parish

1985 Land Use by 25 Year Channel Modification

1985 Land Use by 25 Year Channel Modification and by Sub-Basin

1985 Land Use by 25 Year Channel Modification and by Parish

1985 Land Use by 10 Year Comite Diversion

1985 Land Use by 10 Year Comite Diversion and by Sub-Basin

1978 Land Use by 10 Year Comite Diversion and by Parish

1972-1978 Land Change

1972-1978 Land Change by 100 Year Flood Plain

1972-1978 Land Change by 100 Year Flood Plain and by Sub-Basin

1972-1978 Land Change by 100 Year Flood Plain and by Parish

1972-1978 Land Change by 25 Year Channel Modification

1972-1978 Land Change by 25 Year Channel Modification and by Sub-Basin

1972-1978 Land Change by 25 Year Channel Modification and by Parish

1972-1978 Land Change by 10 Year Comite Diversion

1972-1978 Land Change by 10 Year Comite Diversion and by Sub-Basin

1978-1985 Land Change by 10 Year Comite Diversion and by Parish

1978-1985 Land Change

1978-1985 Land Change by 100 Year Flood Plain

1978-1985 Land Change by 100 Year Flood Plain and by Sub-Basin

1978-1985 Land Change by 100 Year Flood Plain and by Parish

1978-1985 Land Change by 25 Year Channel Modification

1978-1985 Land Change by 25 Year Channel Modification and by Sub-Basin

1978-1985 Land Change by 25 Year Channel Modification and by Parish

1978-1985 Land Change by 10 Year Comite Diversion

1978-1985 Land Change by 10 Year Comite Diversion and by Sub-Basin

1978-1985 Land Change by 10 Year Comite Diversion and by Parish

Table 4. Land use / land cover scenarios calculated for the Office of State Planning for the 1972-1985 period within the Amite River Basin, Louisiana.

1972 Land Use

1972 Land Use by Sub-Basin

1972 Land Use by Parish

1972-1985 Land Change

1972-1985 Land Change by Sub-Basin

1972-1985 Land Change by Parish

3.0 RESULTS AND RECOMMENDATIONS

The results of this project take the forms of tables, maps, report size laser plots, and slides. The tables representing various acreage figures by basin parameter are found in Appendices A and B. They are found in the order as outlined in the GIS and Data Processing Section (2.3.2) of this report (Tables 3 and 4). Appendix A was generated for the COE and a slightly reformatted version (Appendix B) was generated for the Louisiana Office of State Planning. The list of plotted land use / land cover and floodplain maps is represented in Table 5. The list of color 35mm slides is found in Table 6.

Numerous data sources of varying scales and categories were merged to generate the final products of this project. Therefore, it is appropriate to present a brief discussion of selected data sets. The majority of data sources are described in Hill, et al. (1987) which represents the initial data base. This evaluation, therefore, concentrates only on the USGS generated 1972 land use / land cover and COE provided floodplain data sets. The 1972 polygons were plotted and overlain on 1985 land use / land cover polygons for visual inspection. The 1972 polygons were formed by straight lines and, therefore, varied in shape from the curved polygon edges of the 1978 and 1985 boundaries. The exact locations varied slightly on all sides, but the corresponding polygons for these three dates could be discerned. There were also differences in specific class acreage estimates. The USGS interpretors of the 1972 data apparently chose a slightly different classification scheme. This was, however, modified to make it compatible with the latter data sets (1978 and 1985). The interpretors also apparently chose to map subcategories within a class differently on the 1972 data. As an example, they chose to put most of the forest acreage in the "Mixed Forest Land" category for 1972. For 1978 they chose to be more specific and, therefore, put more acreage into the USGS Level 2 (Anderson, et al. 1976) categories of "Deciduous Forest Land" and "Evergreen Forest Land." This process is typically called "grouping" versus "splitting" categories. The total or combined forested acreage is, however, compatible between all mapped data. These data sets should be used with these considerations in mind.

The floodplain data sets represented portions of a total of 11 (1:62,500) maps. Due to the complexity of visualizing multiple (3) floodplain boundaries, map separates were generated for the two quadrangles (Baton Rouge and Zachary) where the project designs most modified the 100 year floodplain boundaries. The labels (i.e., (1) inside and (2) outside the floodplain) may be a bit confusing initially due to the fact that floodplain boundaries change as project designs are outlined on the same map. These changes are discernible if the reader notices that the 100 year floodplain (solid lines) is reduced to 25 year (dashed lines) and 10 year floodplain (dotted lines) boundaries where planned projects have an effect. The majority of floodplain boundaries are represented by the same line, particularly in the southern and northern reaches of the study area. This is because the 100 year floodplain does not change as the 25 and 10 year modifications are put into effect.

Several recommendations are proposed if further data analysis is required by the COE for the Amite River Basin study area. The detailed SCS soil series maps should be entered into the GIS as they are made available. A few are presently complete. The COE has generated numerous other detailed data sets of the Amite study area (i.e., 2 foot contours, building locations and associated attributes). These data should also be added to the GIS. There is also an Environmental Impact Statement (EIS) being conducted for the proposed Darlington Reservoir. Numerous maps (i.e., wildlife habitats, archeological sites) are likely to be generated through this EIS. These too should be input to the GIS. It is recommended that these future maps be standardized where they could be relatively easily input to this GIS.

The COE and associated Louisiana state agencies will be involved with various aspects of the Amite River Basin for years to come. The proposed GIS could then be used to accurately and cost effectively generate numerous scenarios (i.e., land use change, flood damage assessment by contour). The GIS could be further used by the COE and agencies to develop, test and/or calibrate numerous other water simulation models (i.e., SLOSH, floods) that could and should be introduced as planning tools within the COE district and state.

Table 5. Final list of 1:62,500 maps (total 20) generated as results of this project for the Amite River Basin study area.

Map Type	USGS Map Name
1972 Land-Use / Cover	**Baton Rouge**
	Denham Springs
	Donaldsonville
	Felixville
	Mount Airy
	Pine Grove
	Springfield
	White Castle
	Zachary
Floodplains	
50,25,10	**Baton Rouge**
50	**Denham Springs**
25	**Denham Springs**
10	**Denham Springs**
50,25,10	**Donaldsonville**
50,25,10	**Mount Airy**
50,25,10	**Pine Grove**
50,25,10	**Springfield**
50	**Zachary**
25	**Zachary**
10	**Zachary**

Table 6. Listing of 35mm color slides depicting various land-use scenarios of parameters within the Amite River Basin.

1 - 1972 Land Use
2 - 1972 Land Use and Sub-Basins
3 - 1972 Land Use and Parish Boundaries
4 - 100 Year Floodplain
5 - 25 Year Floodplain
6 - 10 Year Floodplain
7 - 1972 Land Use and 100 Year Floodplain
8 - 1972 Land Use and 25 Year Floodplain
9 - 1972 Land Use and 10 Year Floodplain
10 - 1978 Land Use and 100 Year Floodplain
11 - 1978 Land Use and 25 Year Floodplain
12 - 1978 Land Use and 10 Year Floodplain
13 - 1985 Land Use and 100 Year Floodplain
14 - 1985 Land Use and 25 Year Floodplain
15 - 1985 Land Use and 10 Year Floodplain

4.0 LITERATURE CITED

Anderson, J.R., E.E. Hardy, J.T. Roach, and R.E. Witmer. 1976. A Land-use and Land-cover Classification for Use with Remote Sensor Data, Professional Paper 964, U.S. Geological Survey, Reston, Virginia.

Hill, J.M., S.E. Dicks, R.N. Terry, and D.L. Worthy. 1987. Historical Land-Cover Change Mapping for Floodplain Management within the Amite River Basin, Louisiana. Final Report, RSIP T.R. 3.01.87. Remote Sensing and Image Processing Laboratory, Louisiana State University, Baton Rouge.

PROJECTION OF LAND USES IN THE AMITE RIVER BASIN STUDY AREA 1990 - 2040

Report prepared for
The U.S. Army, Corps of Engineers

by
The Louisiana State Planning Office

Research and Analysis
by
Glen Daigre

May, 1988

PROJECTION OF LAND USES IN THE AMITE RIVER BASIN STUDY AREA 1990 - 2040

Introduction

The projection of future land uses is a process based upon three principles: knowledge of planned activities in an area, awareness of constraints upon development, and the extension of historical trends. All of these factors become less reliable predictors as the time from the present increases. Projection reliability also decreases proportionately with the size of the area for which the projection is being made due to the greater impact of unpredic-table, individual decisions. Thus, while short term projections for the entire study area may be considered relatively dependable, long term projections for a single subbasin are much less reliable. Users of land use projections should consider these limitations in the application of this type of data.

Methodology

The primary factor used for projection in this study is the extension of historical trends. Knowledge of planned activities has a very short term utility and has the added danger of the introduction of bias. Consequently, in this study the knowledge factor is used only for the verification of predicted trends and as background information in sub-basin descriptions. The factor pertaining to constraints upon develop-ment is used in this study to exclude wetlands from being projected for development, as it is assumed that various governmental regulations will prevent or greatly deter such conversion.

Unfortunately, the useable data record of historical land use in the study area is not long (1978 to 1986). However, it is the opinion of the investigator, a professional geographer and a resident of the study area for over thirty years, that occurrences during this period of record reflect longer term trends in the urbanization of the area.

Allocation

The major conversion of lands to urban use occurs in the residential and commercial land use categories. Residential use is, of course, tied to population. The relationships between population and residential land

use form the basis for projection. The following process is used to determine future residential and commercial increases in the study area.

1. Determine the acreage of total residential growth (between 1978 and 1986) for each subbasin and for the total study area.

2. Divide residential growth for each subbasin by the total residential growth in the study area. This provides the percentage of growth to be alloted to each subbasin.

3. Determine the relationship between residential growth and population growth by dividing the total acreage growth by the population increase experienced between 1978 and 1986.

4. Using projected population (see Table) accordingly project residential growth then allocate to individual basins as determined in step 2.

These steps provide the basic information to project residential growth in the study area. Commercial land use is somewhat related to residential land use. However, certain areas are commercial centers while other areas are free of commercial development. Consequently, individual subbasins vary greatly in the relationship between commercial land use and residential land use. In order to devise a rational method of projecting commercial land use with available information, the data for residential growth and commercial growth were examined to find categories of this relationship and to quantify these categories. The following categories were established.

1. Very low commercial growth
Subbasins in this category are rural, "end-of-the-line" areas. They are either without commercial centers or have very small centers which have fully developed their potential. Any commercial growth would be for facilities such as convenience stores. No commercial growth is assigned to these areas in the projections.

2. Low commercial growth
These areas, while rural, are either near commercial centers which may have some "spill-over" effect or are along major transportation routes, or contain small commercial centers with some potential for growth. The commercial to residential growth ratio for these areas is 0.044.

3. Moderate commercial growth
These subbasins are near center city or other rapidly developing areas. Considerable "spill-over" can be expected. Commercial development will exceed local needs. The ratio for these areas is 0.134.

POPULATION PROJECTIONS
FOR
AMITE RIVER BASIN STUDY AREA

	1970	1978[2]	1980	1986	1990	2000	2010[2]	2020[2]	2030[2]	2040
Ascension[1]	26,260	36,153	38,626	46,576	49,107	54,712	59,779	63,975	67,300	70,862
East Baton Rouge	285,167	343,096	366,191	392,547	408,100	442,000	471,650	499,775	519,925	541,000
Livingston[1]	27,275	42,493	46,297	57,994	62,157	72,905	80,838	85,938	78,777	92,763
Iberville[1,3]	3,215	3,989	4,182	5,065	5,654	6,568	7,761	8,954	10,147	11,340
TOTAL	341,917	425,731	455,296	502,182	525,018	576,185	620,028	658,642	687,149	715,965

1. Portion in Amite River Basin Study Area
   Percentage of growth relative to entire parish based upon 1970-80 experience

2. Data interpolated assuming constant growth rate

3. Iberville data obtained from Population Projections to 2000 for Louisiana, University of New Orleans and Louisiana State Planning Office, 1983. Data beyond year 2000 projected at rate from 1980-2000.

Base population data supplied by Corps of Engineers unless otherwise noted.

4. High commercial growth
These subbasins contain the small urban centers of Zachary, Baker, Denham Springs and Gonzales; and the rapidly developing areas of south and southeastern Baton Rouge. Additionally, these areas contain major highways which provide high potential for future development of market centers. The ratio for these areas is 0.650.

5. Very high commercial growth
Subbasins in this group are nearly fully developed and are located in or near downtown Baton Rouge. The large parcels of land prefered by developers for residential growth are not available and the land costs are high. As a result commercial development is more likely to occur than residential. The ratio for these subbasins is 1.1.

Projections of increases in commercial land use are made in this study by applying the appropriate ratio to the residential growth for each subbasin.

Industrial projections are somewhat more difficult to determine than are projections for residential and commercial lands. This is due to a variety of influences beyond the scope of analysis in a study of this scope. Due to the greater impact of these unpredictable influences upon industrial land uses, this study does not project future industrial areas for individual subbasins. Rather these projections are made for "regions" which are groups of subbasins defined in the Discussion section of this study. The industrial land use projections are extensions of the trend established between 1978 and 1985.

Disallocation

The increase of urban land uses causes a decrease in the non-urban land uses. For the purposes of this project all urban growth will be accommodated from agricultural and forested lands (termed "available land" in this study.) Examination of the data for the period 1978 to 1985 indicates that a given piece of agricultural land is more likely to be converted to urban uses than a given piece of forested land. The relatively greater propensity for conversion for agricultural land is the result of two factors: location and ease. "Location", in this case, refers to the greater concentration of agricultural land near urban centers and "ease" refers to the various characteristics of agricultural land which make its conversion to urban uses more cost effective. In the process of predicting future land uses, location is automatically taken into consideration because subbasins near growth centers will have a relatively greater "draw" (i.e. more land will be converted and therefore proportionately more agricultural land.) This leaves only the "ease" factor to be determined.

To acquire the "ease" factor, the first step is to establish how much agricultural land would have been converted in each subbasin if there were no greater utility to converting agricultural land over forested land.

SUPPLEMENT TO
"PROJECTION OF LAND USES IN
THE AMITE RIVER BASIN STUDY AREA
1990 - 2040"

Report prepared for
The U.S. Army, Corps of Engineers

by
The Louisiana State Planning Office

Research and Analysis
by
Glen Daigre

August, 1988

Introduction

Subsequent to the submittal of the report, "Projection of land uses in Amite River Basin Study Area", additional land use information for the year 1972 became available. This newly available data has been used in this report for comparison with the results previously reported.

Data

The 1972 land use data was generated by the U.S. Geological Survey from aerial photographic information taken in that year. The methodologies and techniques used to generate the data were less precise than those of the 1978 and 1985 data sets, therefore the 1972 data should be considered somewhat less reliable.

Methodology

As the 1972 data is used as a commentary upon the 1978 projections, analysis is concentrated upon the allotment projections determined by the the same method as in the previous study. These allotment figures clearly show the differences in subbasin and region growth projections predicted by the model.

Discussion

Using the 1972 data provides a longer period of record to project trends in land use changes. In using either the 1972 or 1978 data sets the trends are projected from land use changes during the period of record. The differences in projections reflect the land use changes which occurred in the period 1972 to 1978. Unfortunately, due to the methodological and technological differences between the two data sets, some false information is unavoidably introduced. However, this false information affects primarily the final projections and should not be significant when observing the allotment percentages for growth in subbasins.

Analysis

Observance of the allocation data for the subbasins and regions indicates two major patterns of shift between the 1972 and 1978 data sets. The first is greater dispersion of growth throughout the study area for the 1972 data. The second is greater growth concentration in the Northwest and Central regions.

The first pattern, greater dispersion of growth, is demonstrated by these facts:

1. Thirty-five subbasins experienced more rapid growth with the 1972 data as compared with twenty which experienced more rapid growth with the 1978 data.
2. The median value for the 1972 distribution of allocation values is 1.092 as compared with the 1978 median of 0.739.
3. The top five allocations to subbasins in 1972 accounted for 33.414% of the total allocation while the top five in 1978 accounted for 48.537%.
4. There are 9 subbasins receiving no allocation in the 1972 data as contrasted with 12 in the 1978 data.

Projections of greater dispersion of growth are to be expected for a longer period of record. This is due to the fact that a greater "averaging" of land use activities occurs through time. The 1978 to 1985 data set occurred during a time when growth was heavily concentrated in the Southern and Urban regions. Projections made from this data reflected this pattern.

The second major pattern observed from the data is much higher projections for growth in the Northwest and Central regions. This is largely reflective of the occurrence of "white-flight" of blue collar workers from north Baton Rouge into these areas which took place in the late sixties and early seventies. By the late 1970's north Baton Rouge had become largely black and the source for this migration had been depleted.

Conclusions

Using 1972 land use data results in significantly different projections of patterns of development than those resulting from the use of 1978 data. This is explained from the different lengths of the periods of record and from the different areas of concentrated growth.

The significance of these findings related to the projections provided previously is that growth is likely to be less concentrated in the Southern and Urban areas than previously projected. However, these regions are likely to remain the major growth areas for the study area because they contain important traffic arteries as well as the greatest potential for the development of employment. The pattern of concentrated growth in the Northwest and Central region is probably an artifact of a short-lived migration and not apt to reflect long-term trends. Growth in these areas may well exceed the levels previously projected but is unlikely to reach the levels predicted using the 1972 data.

It should be noted that the recent phenomenon of low growth (indeed net population loss) in the study area causes both sets of projections to overestimate growth.

ALLOTMENT PERCENTAGE BY BASIN FOR 1972 AND 1978 PROJECTIONS

BASIN	72	REGION	78	DIFFERENCE
1	0.934	W	1.759	-0.825
2	0.755	W	0.499	0.256
3	2.220	W	2.421	-0.201
4	0.520	W	0.000	0.520
5	0.430	W	0.000	0.430
6	0.000	W	0.000	0.000
7	0.417	W	0.200	0.217
8	1.830	W	0.997	0.833
9	0.358	W	0.077	0.281
10	2.728	W	0.594	2.134
11	0.090	U	0.000	0.090
12	1.470	W	0.000	1.470
13	3.797	W	1.156	2.641
14	3.513	C	1.523	1.990
15	0.000	U	0.000	0.000
16	0.000	U	0.716	-0.716
17	0.186	C	0.014	0.172
18	2.805	C	0.784	2.021
19	2.331	C	0.621	1.710
20	0.000	U	0.000	0.000
21	0.000	U	1.532	-1.532
22	3.257	U	7.647	-4.390
23	0.000	U	0.000	0.000
24	0.976	U	0.780	0.196
25	0.214	U	1.342	-1.128
26	0.000	U	0.000	0.000
27	0.000	U	0.830	-0.830
28	0.873	U	1.813	-0.940
29	5.064	S	10.449	-5.385
30	0.827	U	0.739	0.088
31	3.832	S	6.682	-2.850
32	1.536	S	2.036	-0.500
33	1.551	A	1.492	0.059
34	1.741	A	2.289	-0.548
35	1.092	A	0.277	0.815
36	1.079	A	0.413	0.666
37	1.662	A	1.877	-0.215
38	1.296	A	0.336	0.960
39	1.040	A	0.177	0.863
40	1.164	B	0.476	0.688
41	3.063	A	3.305	-0.242
42	0.483	B	0.005	0.478
43	2.019	S	2.919	-0.900
44	3.573	B	4.234	-0.661
45	17.035	L	16.093	0.942
46	2.833	L	1.904	0.929
47	1.791	L	2.144	-0.353
48	0.665	U	0.666	-0.001
49	0.334	L	0.326	0.008
50	0.000	L	0.390	-0.390
51	2.444	L	1.142	1.302

52	2.331	L	1.510	0.821
53	1.949	E	1.106	0.843
54	2.095	C	0.626	1.469
55	0.825	E	0.390	0.435
56	0.176	E	0.000	0.176
57	0.048	E	0.000	0.048
58	0.003	E	0.000	0.003
59	3.686	B	3.033	0.653
60	3.063	S	7.666	-4.603

REGION KEY

A: ASCENSION - IBERVILLE
B: LOWER BASIN
C: CENTRAL
E: NORTHEAST
L: LIVINGSTON
S: SOUTHERN
U: URBAN
W: NORTHWEST

ALLOCATION PERCENTAGES FOR STUDY REGIONS, 1972 AND 1978 PROJECTIONS

	URBAN	NW	NE	CEN	LIV	SOUTH	ASCEN	L BASIN
72	6.902	15.459	3.001	10.93	26.768	15.514	12.524	8.906
78	16.065	7.703	1.496	3.568	23.509	29.752	10.166	7.748
DIFF.	-9.163	7.756	1.505	7.362	3.259	-14.238	2.358	1.158

BASNO	RESOTH85	COMMER85	INTCIC85	DF85	EF85	MF85	FWET85	NFWET85	QUARRY85	TRANS85	AG85	WATER85	TOT85	RESOTH90	COMMER90	INTCIC90	DF90	EF90	MF90	FWET85
01	706	2	198	2830	0	0	0	0	0	0	7675	46	11457	767.18	2.00	198	2825.08	0.000	0.000	0
02	1319	300	0	1204	0	21	88	0	0	0	2965	0	5897	1368.45	332.14	0	1196.45	0.000	20.868	88
03	2309	159	56	3062	211	944	0	0	0	0	13324	122	20187	2454.38	165.40	56	3057.49	210.689	942.610	0
04	399	0	56	2281	318	720	0	41	0	0	7304	0	11119	433.06	0.00	56	2277.80	317.554	718.990	0
05	324	0	0	2097	251	341	0	0	0	0	5933	0	8946	352.16	0.00	0	2094.01	250.642	340.513	0
06	0	0	74	880	0	0	0	0	0	0	735	28	1717	0.00	0.00	74	880.00	0.000	0.000	0
07	526	79	84	2534	122	40	0	0	0	0	1763	0	5148	553.29	82.66	84	2519.44	121.299	39.770	0
08	1565	74	0	4583	54	0	0	0	160	42	6779	0	13257	1684.83	90.06	0	4559.55	53.724	0.000	0
09	301	163	152	339	0	41	0	0	0	0	1111	0	2107	324.46	166.14	152	337.91	0.000	40.868	0

BASNO	NFWET85	QUARRY85	TRANS90	AG90	WATER85	TOT90	RESOTH00	COMMER00	INTCIC00	DF00	EF00	MF00	FWET85	NFWET85	QUARRY85	TRANS00	AG00	WATER85
01	0	0	0.0000	7618.7	46	11457	910.92	2.00	198	2813.36	0.000	0.000	0	0	0	0.000	7486.7	46
02	0	0	0.0000	2891.1	0	5897	1484.62	407.66	0	1178.01	0.000	20.547	88	0	0	0.000	2718.2	0
03	0	0	0.0000	13178.4	122	20187	2795.97	180.43	56	3046.47	209.930	939.211	0	0	0	0.000	12837.0	122
04	41	0	0.0000	7274.6	0	11119	513.10	0.00	56	2270.26	316.502	716.609	0	41	0	0.000	7205.5	0
05	0	0	0.0000	5908.7	0	8946	418.31	0.00	0	2086.94	249.796	339.365	0	0	0	0.000	5851.6	0
06	0	0	0.0000	735.0	28	1717	0.00	0.00	74	880.00	0.000	0.000	0	0	0	0.000	735.0	28
07	0	0	0.0000	1747.5	0	5148	617.40	91.25	84	2485.18	119.649	39.229	0	0	0	0.000	1711.3	0
08	0	160	0.0000	6708.8	0	13257	1966.40	127.79	0	4480.33	52.790	0.000	0	0	160	0.000	6469.7	0
09	0	0	0.0000	1085.6	0	2107	379.59	173.53	152	335.16	0.000	40.535	0	0	0	0.000	1026.2	0

BASNO	TOT00	RESOTH10	COMMER10	INTCIC10	DF10	EF10	MF10	FWET85	NFWET85	QUARRY85	TRANS10	AG10	WATER85	TOT10	RESOTH20	COMMER20	INTCIC20
01	11457	1041.59	2.00	198	2802.37	0.000	0.000	0	0	0	0.000	7367.0	46	11457	1164.90	2.00	198
02	5897	1590.23	476.30	0	1159.70	0.000	20.227	88	0	0	0.000	2562.5	0	5897	1689.90	541.09	0
03	20187	3106.49	194.09	56	3035.49	209.173	935.827	0	0	0	0.000	12527.9	122	20187	3399.54	206.98	56
04	11119	585.86	0.00	56	2263.33	315.537	714.423	0	41	0	0.000	7142.8	0	11119	654.52	0.00	56
05	8946	478.45	0.00	0	2080.46	249.020	338.311	0	0	0	0.000	5799.8	0	8946	535.20	0.00	0
06	1717	0.00	0.00	74	880.00	0.000	0.000	0	0	0	0.000	735.0	28	1717	0.00	0.00	74
07	5148	675.68	99.06	84	2453.93	118.145	38.736	0	0	0	0.000	1678.5	0	5148	730.68	106.43	84
08	13257	2222.35	162.08	0	4407.06	51.927	0.000	0	0	160	0.000	6253.6	0	13257	2463.90	194.45	0
09	2107	429.70	180.25	152	332.21	0.000	40.179	0	0	0	0.000	972.7	0	2107	477.00	186.58	152

BASNO	DF20	EF20	MF20	FWET85	NFWET85	QUARRY85	TRANS20	AG20	WATER85	TOT20	RESOTH30	COMMER30	INTIC30	DF30	EF30	MF30	FWET85	NFWET85
01	2791.71	0.000	0.000	0	0	0	0	7254.4	46	11457	1266.24	2.00	198	2782.72	0.000	0.000	0	0
02	1141.03	0.000	19.902	88	0	0	0	2417.1	0	5897	1771.81	594.32	0	1124.57	0.000	19.615	88	0
03	3024.30	208.402	932.377	0	0	0	0	12237.4	122	20187	3640.36	217.58	56	3014.45	207.723	929.340	0	0
04	2256.74	314.618	712.342	0	41	0	0	7083.8	0	11119	710.95	0.00	56	2251.28	313.856	710.618	0	41
05	2074.29	248.282	337.307	0	0	0	0	5750.9	0	8946	581.84	0.00	0	2069.17	247.669	336.475	0	0
06	880.00	0.000	0.000	0	0	0	0	735.0	28	1717	0.00	0.00	74	880.00	0.000	0.000	0	0
07	2424.35	116.721	38.269	0	0	0	0	1647.6	0	5148	775.88	112.48	84	2399.97	115.547	37.884	0	0
08	4336.80	51.099	0.000	0	0	160	0	6050.7	0	13257	2662.40	221.05	0	4278.19	50.409	0.000	0	0
09	329.03	0.000	39.795	0	0	0	0	922.6	0	2107	515.86	191.79	152	326.11	0.000	39.441	0	0

BASNO	QUARRY85	TRANS30	AG30	WATER85	TOT30	RESOTH40	COMMER40	INTIC40	DF40	EF40	MF40	FWET85	NFWET85	QUARRY85	TRANS40	AG40	WATER85	TOT40
01	0	0	7162.0	46	11457	1371.78	2.00	198	2773.16	0.000	0.000	0	0	0	0	7066.1	46	11457
02	0	0	2298.7	0	5897	1857.11	649.77	0	1106.44	0.000	19.298	88	0	0	0	2176.4	0	5897
03	0	0	11999.5	122	20187	3891.18	228.62	56	3003.62	206.977	926.002	0	0	0	0	11752.6	122	20187
04	0	0	7035.3	0	11119	769.72	0.00	56	2245.55	313.058	708.811	0	41	0	0	6984.9	0	11119
05	0	0	5710.8	0	8946	630.41	0.00	0	2063.81	247.027	335.603	0	0	0	0	5669.1	0	8946
06	0	0	735.0	28	1717	0.00	0.00	74	880.00	0.000	0.000	0	0	0	0	735.0	28	1717
07	0	0	1622.2	0	5148	822.95	118.79	84	2374.51	114.321	37.482	0	0	0	0	1595.9	0	5148
08	160	0	5884.9	0	13257	2869.14	248.75	0	4216.38	49.680	0.000	0	0	160	0	5713.0	0	13257
09	0	0	881.8	0	2107	556.34	197.22	152	322.79	0.000	39.039	0	0	0	0	839.6	0	2107

BASNO	RESOTH85	COMMER85	INTCIC85	DF85	EF85	MF85	FWET85	NFWET85	QUARRY85	TRANS85	AG85	WATER85	TOT85	RESOTH90	COMMER90	INTCIC90	DF90	EF90	MF90	FWET85
10	3701	369	262	1912	0	0	0	0	87	110	2362	0	8803	3879.66	392.94	262	1885.4	0	0.000	0
11	368	294	1516	634	0	0	384	6	204	0	153	172	3731	373.91	300.50	1516	625.4	0	0.000	384
12	2146	190	0	1368	0	0	0	0	0	99	1051	0	4854	2242.28	252.58	0	1341.0	0	0.000	0
13	2862	20	0	2743	0	0	0	0	0	0	3716	0	9341	3110.70	30.94	0	2675.0	0	0.000	0
14	2648	122	28	1142	0	193	28	0	22	85	3629	30	7927	2878.11	132.12	28	1132.5	0	191.388	28
15	2792	857	3052	313	0	0	0	0	0	0	167	0	7181	2792.00	857.00	3052	313.0	0	0.000	0
16	4698	1184	133	1288	0	0	0	0	54	0	452	0	7809	4698.00	1184.00	133	1288.0	0	0.000	0
17	140	5	0	1305	0	0	0	0	0	83	557	0	2090	152.17	5.54	0	1305.0	0	0.000	0
18	2705	79	138	1824	0	0	0	0	48	0	1027	0	5821	2888.70	103.62	138	1715.1	0	0.000	0

BASNO	NFWET85	QUARRY85	TRANS90	AG90	WATER85	TOT90	RESOTH00	COMMER00	INTCIC00	DF00	EF00	MF00	FWET85	NFWET85	QUARRY85	TRANS00	AG00
10	0	87	0.000	2296.0	0	8803	4299.46	449.19	262	1757.0	0	0.000	0	0	87	0.000	1948.3
11	6	204	0.000	149.2	172	3731	387.79	315.77	1516	605.0	0	0.000	384	6	204	0.000	140.4
12	0	0	0.000	1018.1	0	4854	2468.51	399.63	0	1181.4	0	0.000	0	0	0	0.000	804.4
13	0	0	0.000	3524.4	0	9341	3695.07	56.65	0	2511.3	0	0.000	0	0	0	0.000	3078.0
14	0	22	0.000	3484.9	30	7927	3418.77	155.91	28	1103.4	0	186.481	28	0	22	0.000	2954.4
15	0	0	0.000	167.0	0	7181	2792.00	857.00	3052	313.0	0	0.000	0	0	0	0.000	167.0
16	0	54	0.000	452.0	0	7809	4698.00	1184.00	133	1288.0	0	0.000	0	0	54	0.000	452.0
17	0	0	70.299	557.0	0	2090	180.75	6.79	0	1305.0	0	0.000	0	0	0	40.456	557.0
18	0	48	0.000	927.5	0	5821	3320.34	161.46	138	1455.4	0	0.000	0	0	48	0.000	697.8

BASNO	WATER85	TOT00	RESOTH10	COMMER10	INTCIC10	DF10	EF10	MF10	FWET85	NFWET85	QUARRY85	TRANS10	AG10	WATER85	TOT10	RESOTH20	COMMER20
10	0	8803	4681.06	500.33	262	1631.5	0	0.000	0	0	87	0.000	1641.1	0	8803	5041.20	548.59
11	172	3731	400.41	329.66	1516	586.4	0	0.000	384	6	204	0.000	132.5	172	3731	412.33	342.76
12	0	4854	2674.17	533.31	0	1028.5	0	0.000	0	0	0	0.000	618.1	0	4854	2868.25	659.46
13	0	9341	4226.27	80.03	0	2353.3	0	0.000	0	0	0	0.000	2681.5	0	9341	4727.59	102.09
14	30	7927	3910.26	177.54	28	1065.5	0	180.076	28	0	22	0.000	2485.6	30	7927	4374.09	197.95
15	0	7181	2792.00	857.00	3052	313.0	0	0.000	0	0	0	0.000	167.0	0	7181	2792.00	857.00
16	0	7809	4698.00	1184.00	133	1288.0	0	0.000	0	0	54	0.000	452.0	0	7809	4698.00	1184.00
17	0	2090	206.74	7.94	0	1305.0	0	0.000	0	0	0	13.328	557.0	0	2090	231.26	9.02
18	0	5821	3712.71	214.03	138	1208.9	0	0.000	0	0	48	0.000	499.4	0	5821	4083.01	263.65

BASNO	INTCIC20	DF20	EF20	MF20	FWET85	NFWET85	QUARRY85	TRANS20	AG20	WATER85	TOT20	RESOTH30	COMMER30	INTCIC30	DF30	EF30	MF30	FWET85
10	262	1504.7	0	0.000	0	0	87	0	1359.5	0	8803	5337.15	588.24	262	1393.1	0	0.000	0
11	1516	568.8	0	0.000	384	6	204	0	125.1	172	3731	422.11	353.53	1516	554.3	0	0.000	384
12	0	876.0	0	0.000	0	0	0	0	450.3	0	4854	3027.74	763.13	0	743.0	0	0.000	0
13	0	2195.5	0	0.000	0	0	0	0	2315.8	0	9341	5139.56	120.21	0	2058.5	0	0.000	0
14	28	1018.7	0	172.162	28	0	22	0	2056.1	30	7927	4755.26	214.72	28	970.5	0	164.012	28
15	3052	313.0	0	0.000	0	0	0	0	167.0	0	7181	2792.00	857.00	3052	313.0	0	0.000	0
16	133	1288.0	0	0.000	0	0	54	0	452.0	0	7809	4698.00	1184.00	133	1288.0	0	0.000	0
17	0	1297.3	0	0.000	0	0	0	0	552.4	0	2090	251.41	9.90	0	1284.2	0	0.000	0
18	138	965.0	0	0.000	0	0	48	0	323.3	0	5821	4387.31	304.43	138	753.1	0	0.000	0

BASNO	NFWET85	QUARRY85	TRANS30	AG30	WATER85	TOT30	RESOTH40	COMMER40	INTCIC40	DF40	EF40	MF40	FWET85	NFWET85	QUARRY85	TRANS40	AG40	WATER85	TOT40
10	0	87	0	1135.5	0	8803	5645.38	629.55	262	1269.7	0	0.000	0	0	87	0	909.4	0	8803
11	6	204	0	119.1	172	3731	432.31	364.74	1516	539.1	0	0.000	384	6	204	0	112.8	172	3731
12	0	0	0	320.2	0	4854	3193.85	871.10	0	596.2	0	0.000	0	0	0	0	192.9	0	4854
13	0	0	0	2022.7	0	9341	5568.63	139.09	0	1908.9	0	0.000	0	0	0	0	1724.4	0	9341
14	0	22	0	1714.5	30	7927	5152.24	232.19	28	910.9	0	153.938	28	0	22	0	1369.8	30	7927
15	0	0	0	167.0	0	7181	2792.00	857.00	3052	313.0	0	0.000	0	0	0	0	167.0	0	7181
16	0	54	0	452.0	0	7809	4698.00	1184.00	133	1288.0	0	0.000	0	0	54	0	452.0	0	7809
17	0	0	0	544.5	0	2090	272.40	10.83	0	1270.5	0	0.000	0	0	0	0	536.2	0	2090
18	0	48	0	190.2	0	5821	4704.23	346.90	138	518.4	0	0.000	0	0	48	0	65.5	0	5821

BASNO	RESOTH85	COMMER85	INTIC85	DF85	EF85	MF85	FWET85	NFWET85	QUARRY85	TRANS85	AG85	WATER85	TOT85	RESOTH90	COMMER90	INTIC90	DF90	EF90	MF90	FWET85	NFWET85	QUARRY85	TRANS90	AG90
19	1939	71	0	3296	0	77	252	0	5	55	1237	0	6932	2091.68	91.46	0	3219.9	0	75.222	252	0	5	0.000	1196.7
20	597	620	1225	0	0	0	0	0	36	0	0	69	2547	597.00	620.00	1225	0.0	0	0.000	0	0	36	0.000	0.0
21	2988	1504	361	896	0	0	0	0	21	0	704	0	6474	2988.00	1504.00	361	896.0	0	0.000	0	0	21	0.000	704.0
22	5679	2218	375	1528	0	175	0	0	0	30	725	0	10730	5892.34	2356.67	375	1368.8	0	156.768	0	0	0	0.000	580.4
23	777	327	16	30	0	0	0	0	0	0	0	0	1150	777.00	327.00	16	30.0	0	0.000	0	0	0	0.000	0.0
24	1432	488	49	793	0	0	0	0	0	200	143	0	3105	1495.96	529.57	49	793.0	0	0.000	0	0	0	94.470	143.0
25	3151	580	185	460	0	0	0	0	2	0	91	302	4771	3164.99	595.39	185	440.8	0	0.000	0	0	2	0.000	80.8
26	1791	733	150	91	0	0	0	0	0	0	140	0	2905	1791.00	733.00	150	91.0	0	0.000	0	0	0	0.000	140.0
27	3298	1187	213	109	0	0	0	0	0	19	18	0	4844	3298.00	1187.00	213	109.0	0	0.000	0	0	0	19.000	18.0
28	1088	385	129	61	0	0	0	0	0	48	107	11	1829	1145.18	447.90	129	62.6	0	0.000	0	0	0	0.000	33.3
29	5546	680	194	3881	0	0	3869	0	0	390	11195	53	25808	5877.69	724.45	194	3881.0	0	0.000	3869	0	0	13.860	11195.0
30	1172	373	40	207	0	0	0	0	0	0	415	0	2207	1226.14	408.19	40	203.9	0	0.000	0	0	0	0.000	328.8
31	3801	630	501	1701	0	726	90	0	14	49	2122	0	9634	4051.96	793.13	501	1602.1	0	683.785	90	0	14	0.000	1898.0
32	1626	130	726	1848	0	0	0	0	90	335	2298	24	7077	1726.63	195.41	726	1848.0	0	0.000	0	0	90	168.962	2298.0
33	1169	442	1572	11512	0	0	2499	872	0	0	14148	156	32370	1270.58	455.61	1572	11477.5	0	0.000	2499	872	0	0.000	14067.3
34	1312	56	1478	5809	0	90	2553	133	0	0	5860	19	17310	1426.01	61.02	1478	5766.8	0	89.347	2553	133	0	0.000	5783.8
35	823	261	70	780	0	0	0	0	0	0	1996	11	3941	894.52	307.49	70	770.7	0	0.000	0	0	0	0.000	1887.3
36	1151	263	0	522	0	0	1	0	0	0	1053	0	2990	1221.65	308.92	0	507.9	0	0.000	1	0	0	0.000	950.5

BASNO	WATER85	TOT90	RESOTH00	COMMER00	INTIC00	DF00	EF00	MF00	FWET85	NFWET85	QUARRY85	TRANS00	AG00	WATER85	TOT00	RESOTH10	COMMER10	INTIC10	DF10	EF10	MF10	FWET85
19	0	6932	2450.42	139.53	0	2959.0	0	69.126	252	0	5	0	1057.0	0	6932	2776.53	183.23	0	2719.2	0	63.524	252
20	69	2547	597.00	620.00	1225	0.0	0	0.000	0	0	36	0	0.0	69	2547	597.00	620.00	1225	0.0	0	0.000	0
21	0	6474	2988.00	1504.00	361	896.0	0	0.000	0	0	21	0	704.0	0	6474	2988.00	1504.00	361	896.0	0	0.000	0
22	0	10730	6393.60	2682.49	375	953.3	0	109.180	0	0	0	0	216.4	0	10730	6843.55	2974.95	375	481.4	0	55.131	0
23	0	1150	777.00	327.00	16	30.0	0	0.000	0	0	0	0	0.0	0	1150	777.00	327.00	16	30.0	0	0.000	0
24	0	3105	1646.23	627.25	49	669.4	0	0.000	0	0	0	0	113.2	0	3105	1782.84	716.05	49	492.3	0	0.000	0
25	302	4771	3197.86	631.55	185	395.2	0	0.000	0	0	2	0	57.4	302	4771	3227.75	664.42	185	352.5	0	0.000	0
26	0	2905	1791.00	733.00	150	91.0	0	0.000	0	0	0	0	140.0	0	2905	1791.00	733.00	150	91.0	0	0.000	0
27	0	4844	3298.00	1187.00	213	109.0	0	0.000	0	0	0	19	18.0	0	4844	3298.00	1187.00	213	109.0	0	0.000	0
28	11	1829	1147.31	450.24	129	43.6	0	0.000	0	0	0	19	28.8	11	1829	1147.31	450.24	129	43.6	0	0.000	0
29	53	25808	6657.04	828.88	194	3850.9	0	0.000	3869	0	0	0	10355.2	53	25808	7365.50	923.81	194	3814.0	0	0.000	3869
30	0	2207	1353.34	490.87	40	188.4	0	0.000	0	0	0	0	134.3	0	2207	1468.97	566.03	40	132.0	0	0.000	0
31	0	9634	4641.63	1176.41	501	1336.2	0	570.302	90	0	14	0	1304.4	0	9634	5177.66	1524.83	501	1068.9	0	456.210	90
32	24	7077	1963.07	349.09	726	1779.5	0	0.000	0	0	90	0	2145.3	24	7077	2178.00	488.80	726	1678.4	0	0.000	0
33	156	32370	1509.27	487.60	1572	11396.2	0	0.000	2499	872	0	0	13878.0	156	32370	1726.24	516.67	1572	11321.9	0	0.000	2499
34	19	17310	1693.89	72.80	1478	5667.3	0	87.805	2553	133	0	0	5605.2	19	17310	1937.41	83.52	1478	5576.1	0	86.392	2553
35	11	3941	1062.56	416.71	70	746.5	0	0.000	0	0	0	0	1634.3	11	3941	1215.31	516.00	70	718.9	0	0.000	0
36	0	2990	1387.65	416.82	0	470.7	0	0.000	1	0	0	0	713.8	0	2990	1538.54	514.90	0	426.1	0	0.000	1

BASNO	NFWET85	QUARRY85	TRANS10	AG10	WATER85	TOT10	RESOTH20	COMMER20	INTCIC20	DF20	EF20	MF20	FWET85	NFWET85	QUARRY85	TRANS20	AG20	WATER85	TOT20	RESOTH30	COMMER30	INTCIC30
19	0	5	0	932.5	0	6932	3084.30	224.47	0	2490.5	0	58.182	252	0	5	0	817.6	0	6932	3337.21	258.36	0
20	0	36	0	0.0	69	2547	597.00	620.00	1225	0.0	0	0.000	0	0	36	0	0.0	69	2547	597.00	620.00	1225
21	0	21	0	704.0	0	6474	2988.00	1504.00	361	896.0	0	0.000	0	0	21	0	704.0	0	6474	2988.00	1504.00	361
22	0	0	0	0.0	0	10730	6843.55	2974.95	375	481.4	0	55.131	0	0	0	0	0.0	0	10730	6843.55	2974.95	375
23	0	0	0	0.0	0	1150	777.00	327.00	16	30.0	0	0.000	0	0	0	0	0.0	0	1150	777.00	327.00	16
24	0	0	0	64.8	0	3105	1911.76	799.84	49	320.4	0	0.000	0	0	0	0	24.0	0	3105	2017.70	868.71	49
25	0	2	0	37.3	302	4771	3255.95	695.44	185	310.7	0	0.000	0	0	2	0	20.0	302	4771	3279.12	720.94	185
26	0	0	0	140.0	0	2905	1791.00	733.00	150	91.0	0	0.000	0	0	0	0	140.0	0	2905	1791.00	733.00	150
27	0	0	19	18.0	0	4844	3298.00	1187.00	213	109.0	0	0.000	0	0	0	19	18.0	0	4844	3298.00	1187.00	213
28	0	0	19	28.8	11	1829	1147.31	450.24	129	43.6	0	0.000	0	0	0	19	28.8	11	1829	1147.31	450.24	129
29	0	0	0	9588.7	53	25808	8034.10	1013.41	194	3770.1	0	0.000	3869	0	0	0	8874.4	53	25808	8583.55	1087.03	194
30	0	0	0	0.0	0	2207	1482.09	574.56	40	110.4	0	0.000	0	0	0	0	0.0	0	2207	1482.09	574.56	40
31	0	14	0	801.4	0	9634	5683.54	1853.65	501	786.3	0	335.600	90	0	14	0	369.9	0	9634	6099.25	2123.87	501
32	0	90	0	1891.8	24	7077	2380.84	620.65	726	1578.0	0	0.000	0	0	90	0	1657.5	24	7077	2547.53	728.99	726
33	872	0	0	13706.2	156	32370	1931.01	544.11	1572	11251.5	0	0.000	2499	872	0	0	13544.4	156	32370	2099.28	566.66	1572
34	133	0	0	5443.6	19	17310	2167.22	93.63	1478	5489.3	0	85.047	2553	133	0	0	5291.8	19	17310	2356.08	101.94	1478
35	0	0	0	1409.8	11	3941	1359.47	609.71	70	687.6	0	0.000	0	0	0	0	1203.2	11	3941	1477.94	686.71	70
36	0	0	0	509.5	0	2990	1680.95	607.47	0	372.3	0	0.000	1	0	0	0	328.3	0	2990	1797.98	683.54	0

BASNO	DF30	EF30	MF30	FWET85	NFWET85	QUARRY85	TRANS30	AG30	WATER85	TOT30	RESOTH40	COMMER40	INTCIC40	DF40	EF40	MF40	FWET85	NFWET85	QUARRY85	TRANS40	AG40	WATER85	TOT40
19	2300.5	0	53.744	252	0	5	0	725.2	0	6932	3600.62	293.66	0	2100.8	0	49.078	252	0	5	0	630.8	0	6932
20	0.0	0	0.000	0	0	36	0	0.0	69	2547	597.00	620.00	1225	0.0	0	0.000	0	0	36	0	0.0	69	2547
21	896.0	0	0.000	0	0	21	0	704.0	0	6474	2988.00	1504.00	361	896.0	0	0.000	0	0	21	0	704.0	0	6474
22	481.4	0	55.131	0	0	0	0	0.0	0	10730	6843.55	2974.95	375	481.4	0	55.131	0	0	0	0	0.0	0	10730
23	30.0	0	0.000	0	0	0	0	0.0	0	1150	777.00	327.00	16	30.0	0	0.000	0	0	0	0	0.0	0	1150
24	169.6	0	0.000	0	0	0	0	0.0	0	3105	2026.39	874.36	49	155.2	0	0.000	0	0	0	0	0.0	0	3105
25	274.5	0	0.000	0	0	2	0	7.4	302	4771	3299.79	743.66	185	238.5	0	0.000	0	0	2	0	0.0	302	4771
26	91.0	0	0.000	0	0	0	0	140.0	0	2905	1791.00	733.00	150	91.0	0	0.000	0	0	0	0	140.0	0	2905
27	109.0	0	0.000	0	0	0	19	18.0	0	4844	3298.00	1187.00	213	109.0	0	0.000	0	0	0	19	18.0	0	4844
28	43.6	0	0.000	0	0	0	19	28.8	11	1829	1147.31	450.24	129	43.6	0	0.000	0	0	0	19	28.8	11	1829
29	3726.5	0	0.000	3869	0	0	0	8294.9	53	25808	9155.78	1163.71	194	3674.5	0	0.000	3869	0	0	0	7698.0	53	25808
30	110.4	0	0.000	0	0	0	0	0.0	0	2207	1482.09	574.56	40	110.4	0	0.000	0	0	0	0	0.0	0	2207
31	515.1	0	219.831	90	0	14	0	71.0	0	9634	6295.73	2251.57	501	337.6	0	144.093	90	0	14	0	0.0	0	9634
32	1491.2	0	0.000	0	0	90	0	1469.3	24	7077	2721.13	841.84	726	1396.9	0	0.000	0	0	90	0	1277.1	24	7077
33	11193.4	0	0.000	2499	872	0	0	13411.7	156	32370	2274.54	590.14	1572	11132.6	0	0.000	2499	872	0	0	13273.7	156	32370
34	5417.4	0	83.933	2553	133	0	0	5167.6	19	17310	2552.77	110.59	1478	5342.0	0	82.765	2553	133	0	0	5038.8	19	17310
35	657.4	0	0.000	0	0	0	0	1038.0	11	3941	1601.32	766.91	70	621.6	0	0.000	0	0	0	0	870.1	11	3941
36	316.1	0	0.000	1	0	0	0	191.4	0	2990	1919.86	762.76	0	242.9	0	0.000	1	0	0	0	63.4	0	2990

BASNO	RESOTH85	COMMER85	INTCIC85	DF85	EF85	MF85	FWET85	NFWET85	QUARRY85	TRANS85	AG85	WATER85	TOT85	RESOTH90	COMMER90	INTCIC90	DF90	EF90	MF90	FWET85
37	1705	376	1203	4424	0	0	301	0	0	0	4784	49	12842	1813.9	446.775	1203	4363.7	0.0	0.0	301
38	1048	233	786	6848	0	0	940	0	61	287	9391	91	19685	1132.9	288.185	786	6848.0	0.0	0.0	940
39	817	180	200	875	0	0	0	0	0	0	1413	0	3485	885.1	224.284	200	852.0	0.0	0.0	0
40	877	32	171	1517	0	0	6733	0	0	54	4078	54	13516	953.2	32.000	171	1516.5	0.0	0.0	6733
41	2309	128	11	1334	0	12	0	0	0	0	3509	0	7303	2509.6	136.829	11	1319.5	0.0	11.9	0
42	364	0	0	1688	0	0	2609	0	0	0	1694	133	6488	395.6	0.000	0	1677.2	0.0	0.0	2609
43	1522	12	28	320	0	479	0	0	0	0	1788	0	4149	1654.3	29.723	28	313.6	0.0	469.5	0
44	2693	72	0	2170	544	3211	2806	0	0	0	4085	585	16166	2927.0	82.297	0	2127.8	533.4	3148.5	2806
45	13093	699	1063	42	53926	38158	2632	35	33	690	12571	189	123131	14208.8	748.094	1063	41.8	53689.9	37991.0	2632

BASNO	NFWET85	QUARRY85	TRANS90	AG90	WATER85	TOT90	RESOTH00	COMMER00	INTCIC00	DF00	EF00	MF00	FWET85	NFWET85	QUARRY85	TRANS00	AG00	WATER85
37	0	0	0.000	4664.6	49	12842	2069.7	613.068	1203	4221.0	0.0	0.0	301	0	0	0.0000	4385.2	49
38	0	61	146.915	9391.0	91	19685	1332.4	417.849	786	6798.0	0.0	0.0	940	0	61	0.0000	9258.8	91
39	0	0	0.000	1323.6	0	3485	1045.2	328.333	200	795.8	0.0	0.0	0	0	0	0.0000	1115.7	0
40	0	0	0.000	4056.3	54	13516	1132.3	32.000	171	1513.9	0.0	0.0	6733	0	0	0.0000	3879.8	54
41	0	0	0.000	3314.2	0	7303	2981.1	157.572	11	1281.1	0.0	11.5	0	0	0	0.0000	2860.7	0
42	0	0	0.000	1673.1	133	6488	470.0	0.000	0	1651.8	0.0	0.0	2609	0	0	0.0000	1624.2	133
43	0	0	0.000	1653.9	0	4149	1965.0	71.365	28	297.1	0.0	444.7	0	0	0	0.0000	1342.8	0
44	0	0	0.000	3955.9	585	16166	3476.9	106.490	0	2028.0	508.4	3000.9	2806	0	0	0.0000	3654.2	585
45	35	33	0.000	12499.4	189	123131	16830.4	863.447	1063	40.8	52330.8	37029.3	2632	35	33	0.0000	12084.3	189

BASNO	TOT00	RESOTH10	COMMER10	INTCIC10	DF10	EF10	MF10	FWET85	NFWET85	QUARRY85	TRANS10	AG10	WATER85	TOT10	RESOTH20	COMMER20	INTCIC20
37	12842	2302.3	764.235	1203	4088.7	0.0	0.0	301	0	0	0.0000	4133.8	49	12842	2521.8	906.90	1203
38	19685	1513.7	535.718	786	6717.5	0.0	0.0	940	0	61	0.0000	9040.1	91	19685	1684.9	646.96	786
39	3485	1190.7	422.918	200	739.2	0.0	0.0	0	0	0	0.0000	932.2	0	3485	1328.0	512.18	200
40	13516	1295.1	32.000	171	1510.4	0.0	0.0	6733	0	0	0.0000	3720.5	54	13516	1448.7	32.00	171
41	7303	3409.7	176.429	11	1236.2	0.0	11.1	0	0	0	0.0000	2458.6	0	7303	3814.1	194.23	11
42	6488	537.5	0.000	0	1628.5	0.0	0.0	2609	0	0	0.0000	1580.0	133	6488	601.3	0.00	0
43	4149	2247.5	109.219	28	278.0	0.0	416.1	0	0	0	0.0000	1070.1	0	4149	2514.1	144.94	28
44	16166	3976.7	128.483	0	1936.1	485.4	2864.8	2806	0	0	0.0000	3383.6	585	16166	4448.4	149.24	0
45	123131	19213.6	968.307	1063	39.8	51094.2	36154.2	2632	35	33	0.0000	11708.9	189	123131	21462.7	1067.27	1063

BASNO	DF20	EF20	MF20	FWET85	NFWET85	QUARRY85	TRANS20	AG20	WATER85	TOT20	RESOTH30	COMMER30	INTCIC30	DF30	EF30	MF30	FWET85	NFWET85
37	3961.6	0.0	0.0	301	0	0	0.0000	3898.7	49	12842	2702.1	1024.13	1203	3855.3	0.0	0.0	301	0
38	6640.8	0.0	0.0	940	0	61	0.0000	8834.4	91	19685	1825.5	738.37	786	6577.1	0.0	0.0	940	0
39	680.5	0.0	0.0	0	0	0	0.0000	764.3	0	3485	1440.9	585.54	200	627.6	0.0	0.0	0	0
40	1506.1	0.0	0.0	6733	0	0	0.0000	3571.2	54	13516	1574.9	32.00	171	1501.8	0.0	0.0	6733	0
41	1184.2	0.0	10.7	0	0	0	0.0000	2088.8	0	7303	4146.5	208.85	11	1133.2	0.0	10.2	0	0
42	1606.3	0.0	0.0	2609	0	0	0.0000	1538.4	133	6488	653.7	0.00	0	1587.9	0.0	0.0	2609	0
43	256.0	0.0	383.2	0	0	0	0.0000	822.8	0	4149	2733.2	174.30	28	234.1	0.0	350.5	0	0
44	1848.1	463.3	2734.6	2806	0	0	0.0000	3131.3	585	16166	4836.1	166.30	0	1774.8	444.9	2626.2	2806	0
45	38.9	49926.0	35327.6	2632	35	33	0.0000	11356.5	189	123131	23311.0	1148.59	1063	38.1	48965.2	34647.7	2632	35

BASNO	QUARRY85	TRANS30	AG30	WATER85	TOT30	RESOTH40	COMMER40	INTCIC40	DF40	EF40	MF40	FWET85	NFWET85	QUARRY85	TRANS40	AG40	WATER85	TOT40
37	0	0.0000	3707.5	49	12842	2890.0	1146.23	1203	3742.9	0.0	0.0	301	0	0	0.0000	3509.9	49	12842
38	61	0.0000	8666.1	91	19685	1972.0	833.57	786	6510.2	0.0	0.0	940	0	61	0.0000	8491.3	91	19685
39	0	0.0000	631.0	0	3485	1558.4	661.93	200	567.9	0.0	0.0	0	0	0	0.0000	496.7	0	3485
40	0	0.0000	3449.3	54	13516	1706.4	32.00	171	1496.5	0.0	0.0	6733	0	0	0.0000	3323.1	54	13516
41	0	0.0000	1793.3	0	7303	4492.6	224.08	11	1072.3	0.0	9.6	0	0	0	0.0000	1493.4	0	7303
42	0	0.0000	1504.4	133	6488	708.2	0.00	0	1568.6	0.0	0.0	2609	0	0	0.0000	1469.1	133	6488
43	0	0.0000	628.9	0	4149	2961.4	204.88	28	207.6	0.0	310.7	0	0	0	0.0000	436.4	0	4149
44	0	0.0000	2926.7	585	16166	5239.8	184.06	0	1697.6	425.6	2512.0	2806	0	0	0.0000	2715.9	585	16166
45	33	0.0000	11068.4	189	123131	25235.9	1233.29	1063	37.4	47963.8	33939.1	2632	35	33	0.0000	10769.5	189	123131

BASNO	RESOTH85	COMMER85	INTIC85	DF85	EF85	MF85	FWET85	NFWET85	QUARRY85	TRANS85	AG85	WATER85	TOT85	RESOTH90	COMMER90	INTIC90	DF90	EF90	MF90	FWET85
46	2292	149	109	861	2814	4345	801	0	0	120	3942	120	15553	2477.53	157.163	109	856.4	2798.9	4321.6	801
47	1660	33	122	1756	0	4413	439	0	329	133	1244	0	10129	1777.31	48.720	122	1756.0	0.0	4413.0	439
48	600	33	132	1023	0	0	0	0	0	0	143	0	1931	643.54	61.299	132	962.6	0.0	0.0	0
49	660	183	184	240	165	276	0	0	0	0	300	0	2008	681.90	197.234	184	232.4	159.8	267.3	0
50	1053	187	92	117	636	47	0	0	0	0	619	15	2766	1053.00	187.000	92	117.0	636.0	47.0	0
51	2459	311	0	276	305	1223	0	0	58	0	623	36	5291	2619.07	332.449	0	257.8	284.8	1142.1	0
52	1821	0	0	0	0	2608	0	0	78	0	1492	0	5999	1973.68	0.000	0	0.0	0.0	2526.7	0
53	1531	169	38	3818	12403	15110	1576	0	12	0	20492	0	55149	1658.65	174.617	38	3809.8	12376.5	15077.7	1576
54	1635	41	43	1315	7	2391	0	0	358	0	1358	0	7148	1772.21	41.000	43	1283.1	6.8	2332.9	0

BASNO	NFWET85	QUARRY85	TRANS90	AG90	WATER85	TOT90	RESOTH00	COMMER00	INTIC00	DF00	EF00	MF00	FWET85	NFWET85	QUARRY85	TRANS00	AG00	WATER85
46	0	0	0.000	3911.4	120	15553	2913.45	176.344	109	828.0	2706.1	4178.4	801	0	0	0.0000	3720.8	120
47	0	329	0.000	1244.0	0	10129	2052.96	85.656	122	1686.1	0.0	4237.3	439	0	329	0.0000	1177.0	0
48	0	0	0.000	131.6	0	1931	745.83	127.790	132	820.3	0.0	0.0	0	0	0	0.0000	105.1	0
49	0	0	0.000	285.4	0	2008	733.35	230.679	184	214.5	147.5	246.7	0	0	0	0.0000	251.2	0
50	0	0	0.000	619.0	15	2766	1053.00	187.000	92	117.0	636.0	47.0	0	0	0	0.0000	619.0	15
51	0	58	0.000	560.8	36	5291	2995.17	382.846	0	214.5	237.0	950.4	0	0	58	0.0000	417.1	36
52	0	78	0.000	1420.7	0	5999	2332.42	0.000	0	0.0	0.0	2334.2	0	0	78	0.0000	1254.4	0
53	0	12	0.000	20425.8	0	55149	1958.59	187.814	38	3790.6	12314.1	15001.7	1576	0	12	0.0000	20270.2	0
54	0	358	0.000	1311.0	0	7148	2094.61	41.000	43	1207.8	6.4	2196.1	0	0	358	0.0000	1201.1	0

BASNO	TOT00	RESOTH10	COMMER10	INTIC10	DF10	EF10	MF10	FWET85	NFWET85	QUARRY85	TRANS10	AG10	WATER85	TOT10	RESOTH20	COMMER20	INTIC20
46	15553	3309.72	193.780	109	802.0	2621.2	4047.4	801	0	0	0.0000	3548.9	120	15553	3683.69	210.235	109
47	10129	2303.52	119.232	122	1622.4	0.0	4077.2	439	0	329	0.0000	1116.6	0	10129	2539.99	150.919	122
48	1931	838.82	188.232	132	690.0	0.0	0.0	0	0	0	0.0000	81.9	0	1931	926.58	245.274	132
49	2008	780.12	261.081	184	198.0	136.2	227.8	0	0	0	0.0000	220.8	0	2008	824.27	289.773	184
50	2766	1053.00	187.000	92	117.0	636.0	47.0	0	0	0	0.0000	619.0	15	2766	1053.00	187.000	92
51	5291	3337.05	428.659	0	174.1	192.4	771.5	0	0	58	0.0000	293.3	36	5291	3659.70	471.894	0
52	5999	2658.53	0.000	0	0.0	0.0	2156.1	0	0	78	0.0000	1106.4	0	5999	2966.30	0.000	0
53	55149	2231.25	199.811	38	3773.1	12257.3	14932.5	1576	0	12	0.0000	20129.0	0	55149	2488.56	211.133	38
54	7148	2387.68	41.000	43	1138.9	6.1	2070.8	0	0	358	0.0000	1102.6	0	7148	2664.27	41.000	43

BASNO	DF20	EF20	MF20	FWET85	NFWET85	QUARRY85	TRANS20	AG20	WATER85	TOT20	RESOTH30	COMMER30	INTCIC30	DF30	EF30	MF30	FWET85	NFWET85
46	777.4	2540.7	3923.1	801	0	0	0.0000	3387.9	120	15553	3991.02	223.757	109	757.0	2474.2	3820.4	801	0
47	1562.1	0.0	3925.8	439	0	329	0.0000	1060.2	0	10129	2734.32	176.959	122	1512.5	0.0	3801.1	439	0
48	566.1	0.0	0.0	0	0	0	0.0000	61.0	0	1931	998.69	292.150	132	463.4	0.0	0.0	0	0
49	182.3	125.3	209.6	0	0	0	0.0000	192.8	0	2008	860.54	313.351	184	169.1	116.3	194.5	0	0
50	117.0	636.0	47.0	0	0	0	0.0000	619.0	15	2766	1053.00	187.000	92	117.0	636.0	47.0	0	0
51	134.9	149.0	597.6	0	0	58	0.0000	183.8	36	5291	3924.85	507.424	0	101.4	112.1	449.5	0	0
52	0.0	0.0	1985.1	0	0	78	0.0000	969.6	0	5999	3219.21	0.000	0	0.0	0.0	1842.1	0	0
53	3756.6	12203.7	14867.1	1576	0	12	0.0000	19995.9	0	55149	2700.02	220.437	38	3743.1	12159.5	14813.4	1576	0
54	1073.4	5.7	1951.7	0	0	358	0.0000	1011.0	0	7148	2891.56	41.000	43	1019.2	5.4	1853.1	0	0

BASNO	QUARRY85	TRANS30	AG30	WATER85	TOT30	RESOTH40	COMMER40	INTCIC40	DF40	EF40	MF40	FWET85	NFWET85	QUARRY85	TRANS40	AG40	WATER85	TOT40
46	0	0.0000	3256.6	120	15553	4311.09	237.840	109	735.8	2404.7	3713.0	801	0	0	0.0000	3120.7	120	15553
47	329	0.0000	1014.2	0	10129	2936.71	204.079	122	1460.7	0.0	3670.9	439	0	329	0.0000	966.6	0	10129
48	0	0.0000	44.7	0	1931	1073.80	340.971	132	355.5	0.0	0.0	0	0	0	0.0000	28.7	0	1931
49	0	0.0000	170.3	0	2008	898.32	337.908	184	155.2	106.7	178.5	0	0	0	0.0000	147.3	0	2008
50	0	0.0000	619.0	15	2766	1053.00	187.000	92	117.0	636.0	47.0	0	0	0	0.0000	619.0	15	2766
51	58	0.0000	101.7	36	5291	4201.00	544.428	0	65.1	72.0	288.6	0	0	58	0.0000	25.9	36	5291
52	78	0.0000	859.7	0	5999	3482.62	0.000	0	0.0	0.0	1690.9	0	0	78	0.0000	747.5	0	5999
53	12	0.0000	19886.6	0	55149	2920.25	230.127	38	3728.9	12113.5	14757.4	1576	0	12	0.0000	19772.9	0	55149
54	358	0.0000	936.8	0	7148	3128.28	41.000	43	962.4	5.1	1749.8	0	0	358	0.0000	860.4	0	7148

BASNO	RESOTH85	COMMER85	INTCIC85	DF85	EF85	MF85	FWET85	NFWET85	QUARRY85	TRANS85	AG85	WATER85	TOT85	RESOTH90	COMMER90	INTCIC90	DF90	EF90	MF90	FWET85	NFWET85
55	623	77	0	0	812	4839	67	0	1478	0	3381	0	11277	677.05	77.000	0	0.0	807.92	4814.71	67	0
56	133	0	0	0	1006	3780	0	0	3671	17	2202	178	10987	144.56	0.000	0	0.0	1006.00	3780.00	0	0
57	36	38	158	0	4158	1692	0	0	94	0	348	0	6524	39.13	38.000	158	0.0	4155.93	1691.16	0	0
58	2	0	0	0	1656	3883	376	0	1809	30	1681	0	9437	2.17	0.000	0	0.0	1656.00	3883.00	376	0
59	2911	33	744	13509	8024	932	95049	759	0	91	5400	1868	129320	3152.40	33.000	744	13445.6	7986.34	927.63	95049	759
60	2309	27	289	637	143	1276	1	0	32	377	2418	39	7548	2509.65	53.887	289	637.0	143.00	1276.00	1	0

BASNO	QUARRY85	TRANS90	AG90	WATER85	TOT90	RESOTH00	COMMER00	INTCIC00	DF00	EF00	MF00	FWET85	NFWET85	QUARRY85	TRANS00	AG00	WATER85	TOT00
55	1478	0.000	3355.32	0	11277	804.05	77.000	0	0.0	798.33	4757.56	67	0	1478	0.0000	3295.05	0	11277
56	3671	5.442	2202.00	178	10987	171.71	0.000	0	0.0	1003.29	3769.82	0	0	3671	0.0000	2193.17	178	10987
57	94	0.000	347.78	0	6524	46.48	38.000	158	0.0	4151.08	1689.18	0	0	94	0.0000	347.26	0	6524
58	1809	29.826	1681.00	0	9437	2.58	0.000	0	0.0	1656.00	3883.00	376	0	1809	29.4178	1681.00	0	9437
59	0	0.000	5355.03	1868	129320	3719.61	33.000	744	13206.8	7844.51	911.15	95049	759	0	0.0000	5184.92	1868	129320
60	32	149.464	2418.00	39	7548	2981.10	117.061	289	598.5	134.37	1198.95	1	0	32	0.0000	2156.99	39	7548

BASNO	RESOTH10	COMMER10	INTCIC10	DF10	EF10	MF10	FWET85	NFWET85	QUARRY85	TRANS10	AG10	WATER85	TOT10	RESOTH20	COMMER20	INTCIC20	DF20
55	919.50	77.000	0	0.0	789.59	4705.48	67	0	1478	0.0000	3240.43	0	11277	1028.45	77.000	0	0.0
56	196.40	0.000	0	0.0	1000.21	3758.26	0	0	3671	0.0000	2183.13	178	10987	219.70	0.000	0	0.0
57	53.16	38.000	158	0.0	4146.66	1687.39	0	0	94	0.0000	346.79	0	6524	59.47	38.000	158	0.0
58	2.95	0.000	0	0.0	1656.00	3883.00	376	0	1809	29.0466	1681.00	0	9437	3.30	0.000	0	0.0
59	4235.23	33.000	744	12989.3	7715.28	896.14	95049	759	0	0.0000	5031.09	1868	129320	4721.83	33.000	744	12783.5
60	3409.66	174.489	289	552.1	123.94	1105.93	1	0	32	0.0000	1820.88	39	7548	3814.12	228.686	289	505.5

BASNO	EF20	MF20	FWET85	NFWET85	QUARRY85	TRANS20	AG20	WATER85	TOT20	RESOTH30	COMMER30	INTCIC30	DF30	EF30	MF30	FWET85	NFWET85	QUARRY85
55	781.33	4656.21	67	0	1478	0.0000	3189.02	0	11277	1117.98	77.000	0	0.0	774.52	4615.63	67	0	1478
56	997.31	3747.34	0	0	3671	0.0000	2173.66	178	10987	238.84	0.000	0	0.0	994.92	3738.36	0	0	3671
57	4142.50	1685.69	0	0	94	0.0000	346.35	0	6524	64.65	38.000	158	0.0	4139.07	1684.30	0	0	94
58	1656.00	3883.00	376	0	1809	28.6963	1681.00	0	9437	3.59	0.000	0	0.0	1656.00	3883.00	376	0	1809
59	7593.08	881.95	95049	759	0	0.0000	4886.62	1868	129320	5121.72	33.000	744	12614.1	7492.46	870.26	95049	759	0
60	113.47	1012.51	1	0	32	0.0000	1512.76	39	7548	4146.49	273.224	289	464.7	104.31	930.78	1	0	32

BASNO	TRANS30	AG30	WATER85	TOT30	RESOTH40	COMMER40	INTCIC40	DF40	EF40	MF40	FWET85	NFWET85	QUARRY85	TRANS40	AG40	WATER85	TOT40
55	0.0000	3146.87	0	11277	1211.23	77.000	0	0.0	767.41	4573.28	67	0	1478	0.0000	3103.08	0	11277
56	0.0000	2165.89	178	10987	258.78	0.000	0	0.0	992.43	3729.00	0	0	3671	0.0000	2157.79	178	10987
57	0.0000	345.98	0	6524	70.05	38.000	158	0.0	4135.51	1682.85	0	0	94	0.0000	345.60	0	6524
58	28.4084	1681.00	0	9437	3.89	0.000	0	0.0	1656.00	3883.00	376	0	1809	28.1086	1681.00	0	9437
59	0.0000	4768.46	1868	129320	5538.19	33.000	744	12437.4	7387.49	858.07	95049	759	0	0.0000	4645.88	1868	129320
60	0.0000	1267.53	39	7548	4492.65	319.609	289	419.8	94.24	840.92	1	0	32	0.0000	1019.78	39	7548

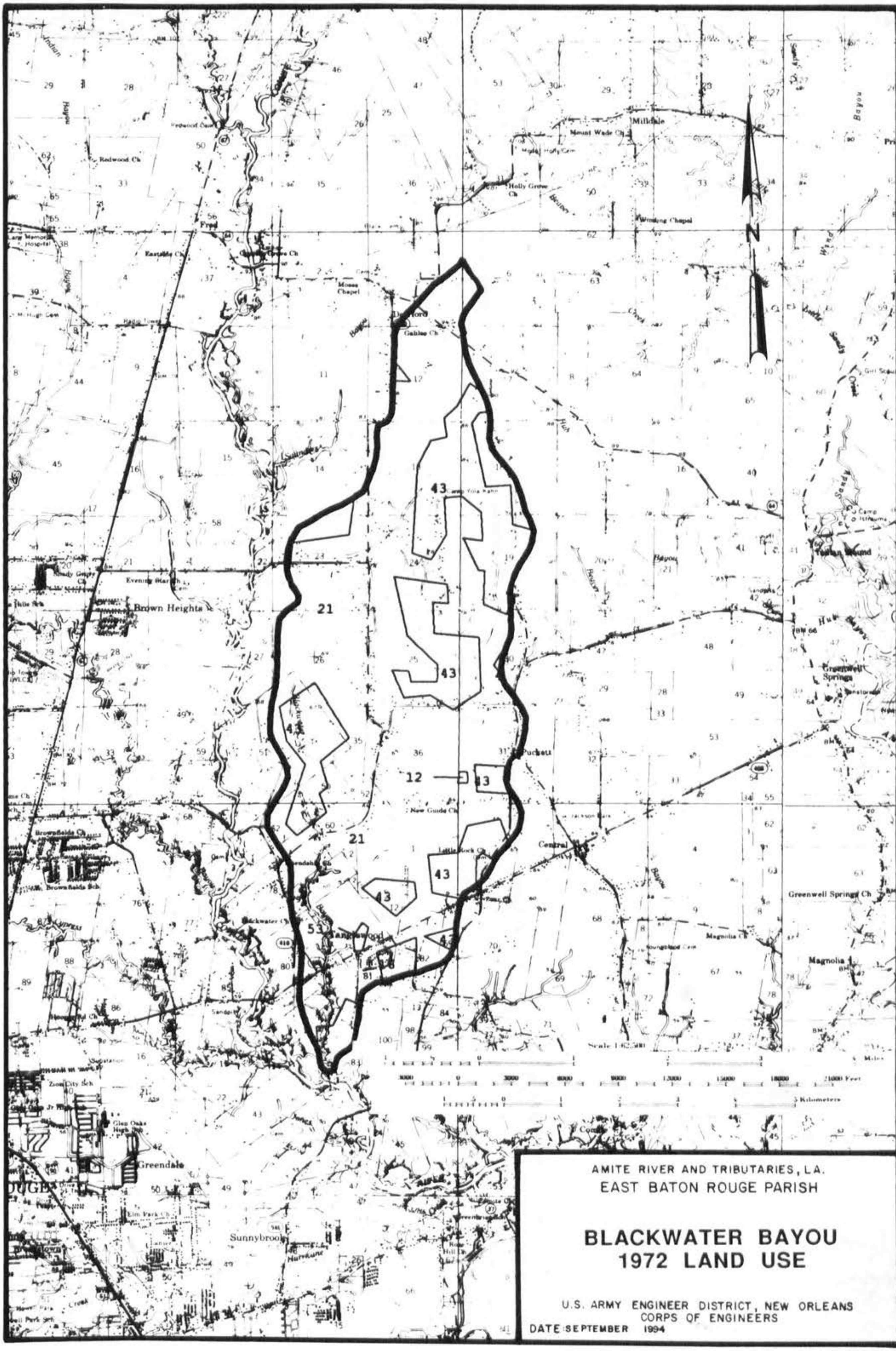
ABBREVIATED LAND USE AND COVER CLASSIFICATION SYSTEM FOR USGS LEVELS I AND II

LEVEL I	LEVEL II
1. Urban or built-up land	11. Residential
	12. Commercial and services
	13. Industrial
	14. Transportation, communication and utilities
	15. Industrial and commercial complexes
	16. Mixed urban or built-up land
	17. Other urban or built-up land
2. Agricultural land	21. Cropland and pasture
	22. Orchards, groves, vineyards, nurseries, and ornamental horticultural areas
	23. Confined feeding operations
	24. Other agricultural land
3. Rangeland	31. Herbaceous rangeland
	32. Shrub and brush rangeland
	33. Mixed rangeland
4. Forest land	41. Deciduous forest land
	42. Evergreen forest land
	43. Mixed forest land
5. Water	51. Streams and canals
	52. Lakes
	53. Reservoirs
	54. Bays and estuaries
6. Wetland	61. Forest wetland
	62. Nonforested wetland
7. Barren land	71. Dry salt flats
	72. Beaches
	73. Sandy areas other than beaches
	74. Bare exposed rock
	75. Strip , mines, quarries, and gravel pits
	76. Transitional areas
	77. Mixed barren land

AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH

LAND USE INDEX

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: SEPTEMBER 1994

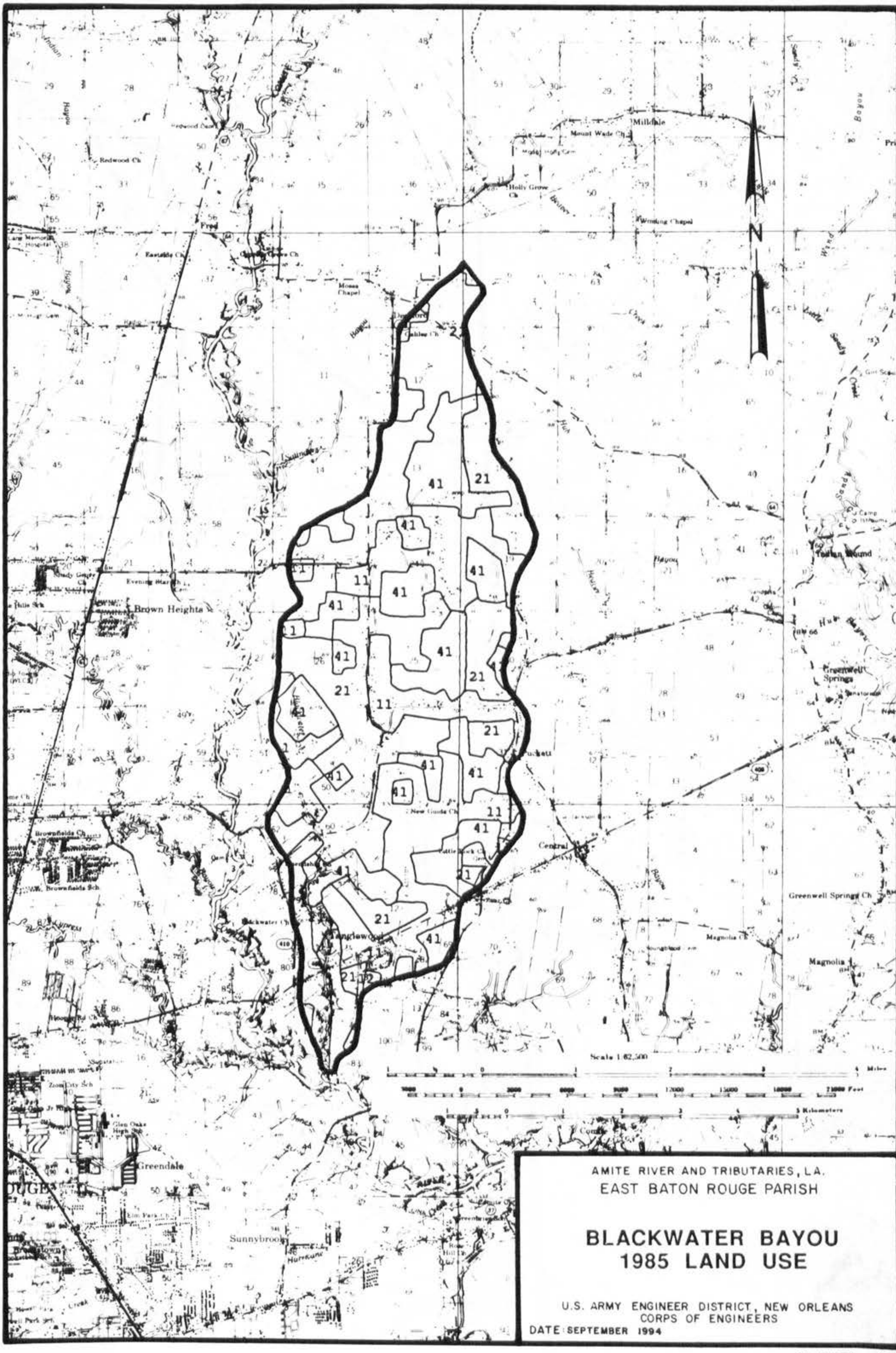


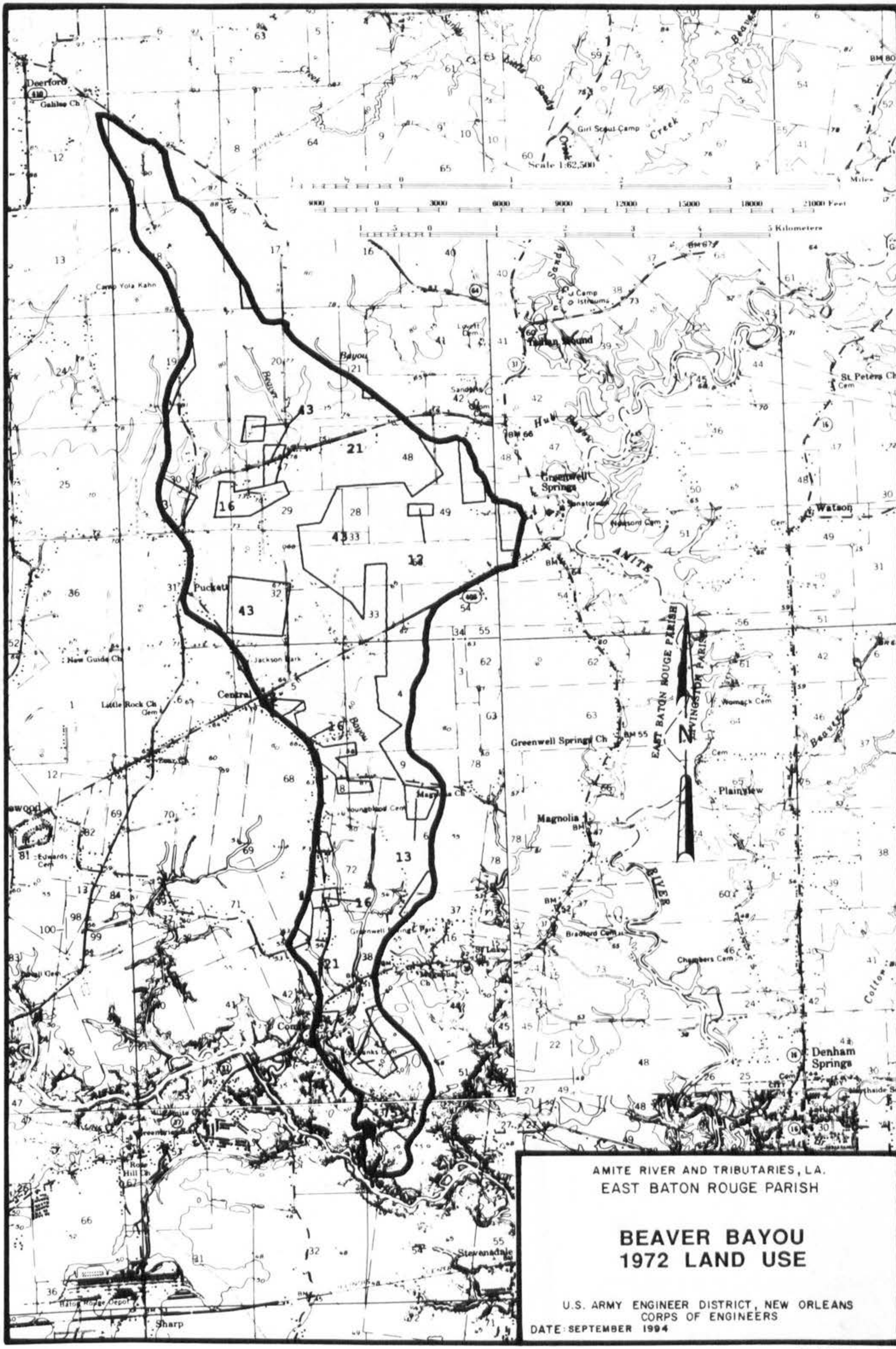
AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH

BLACKWATER BAYOU 1972 LAND USE

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE SEPTEMBER 1994

PLATE J-2

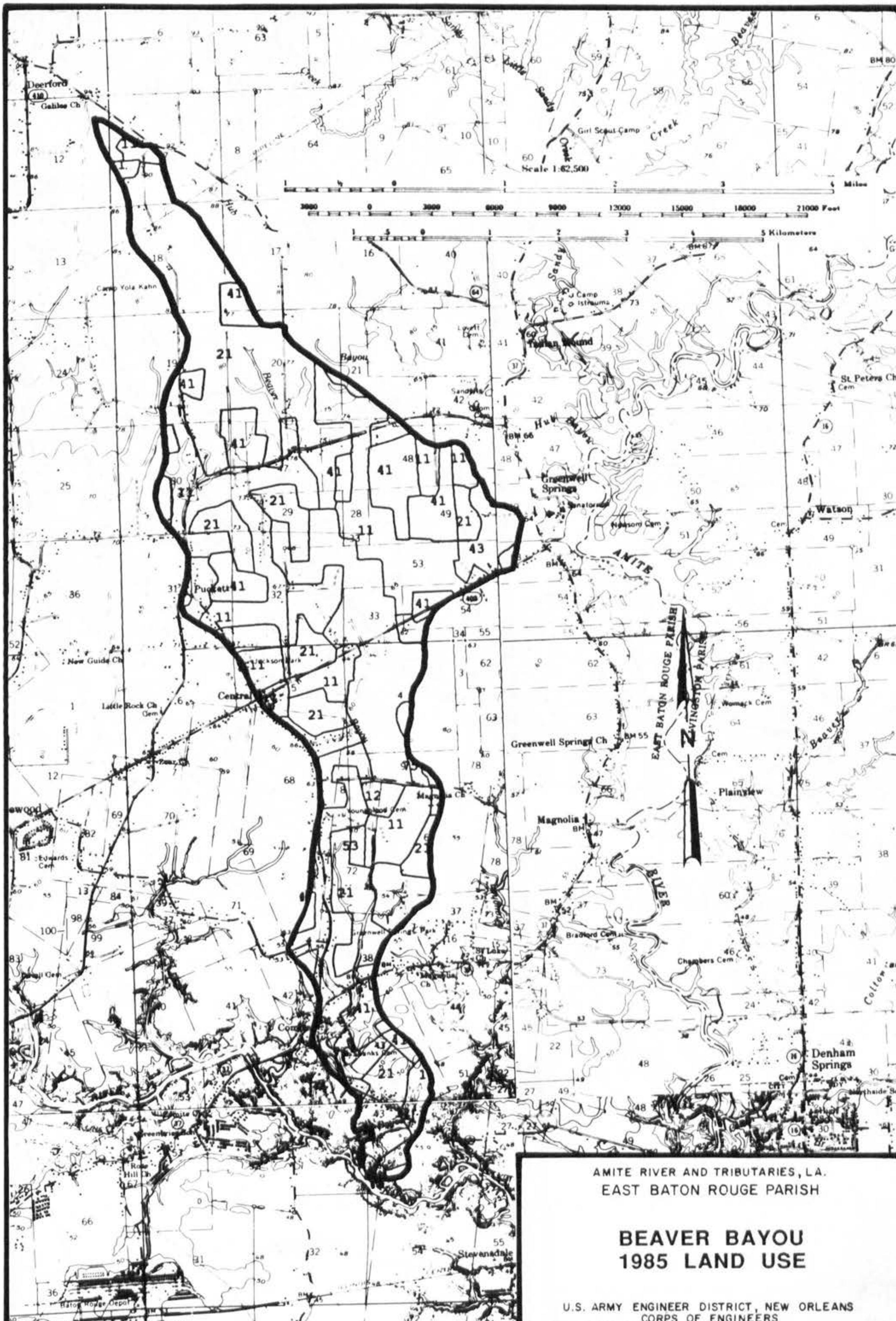

AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH
BLACKWATER BAYOU
1985 LAND USE
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: SEPTEMBER 1994



AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH

BEAVER BAYOU
1972 LAND USE

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: SEPTEMBER 1994

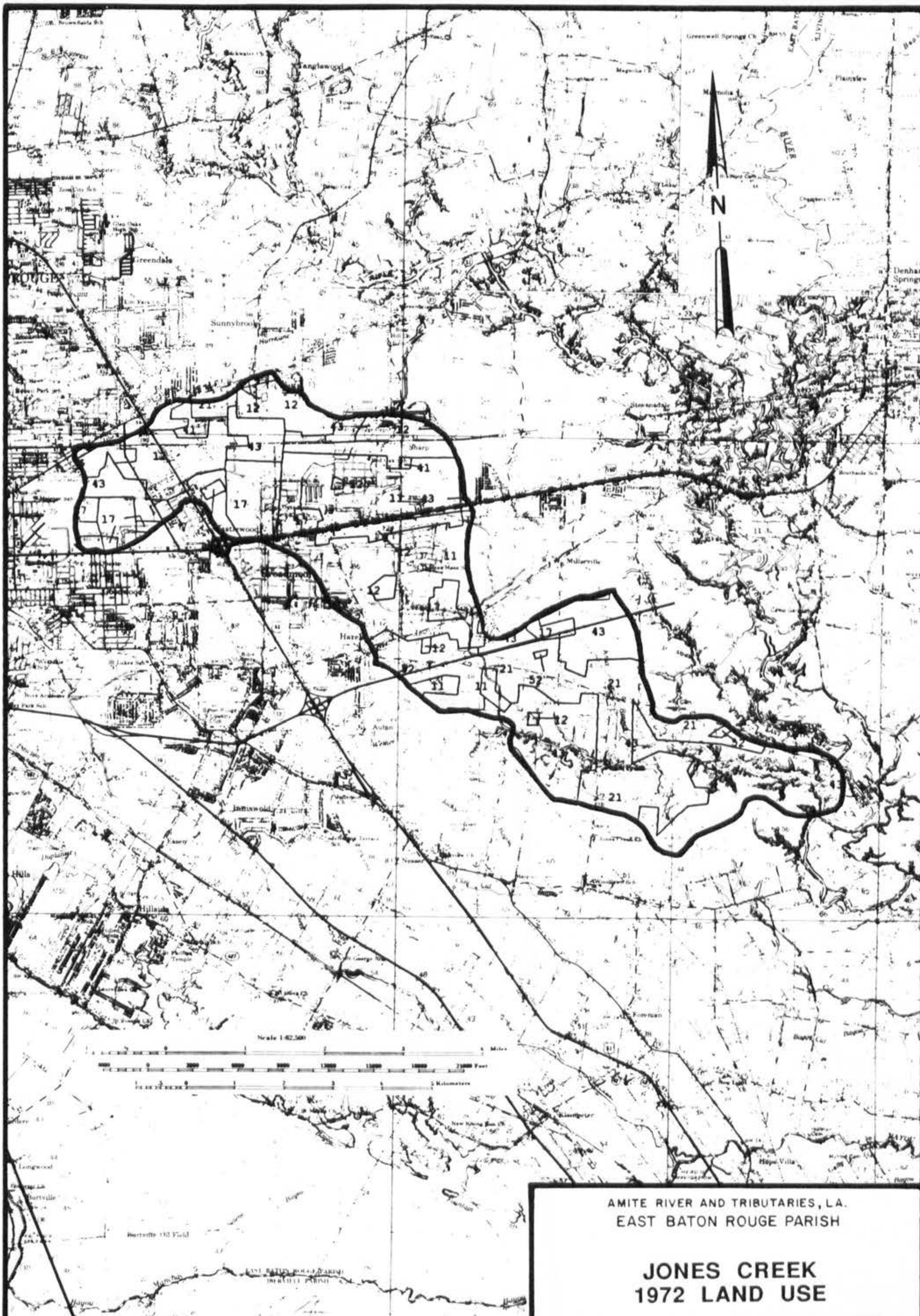


AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH

BEAVER BAYOU
1985 LAND USE

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: SEPTEMBER 1994

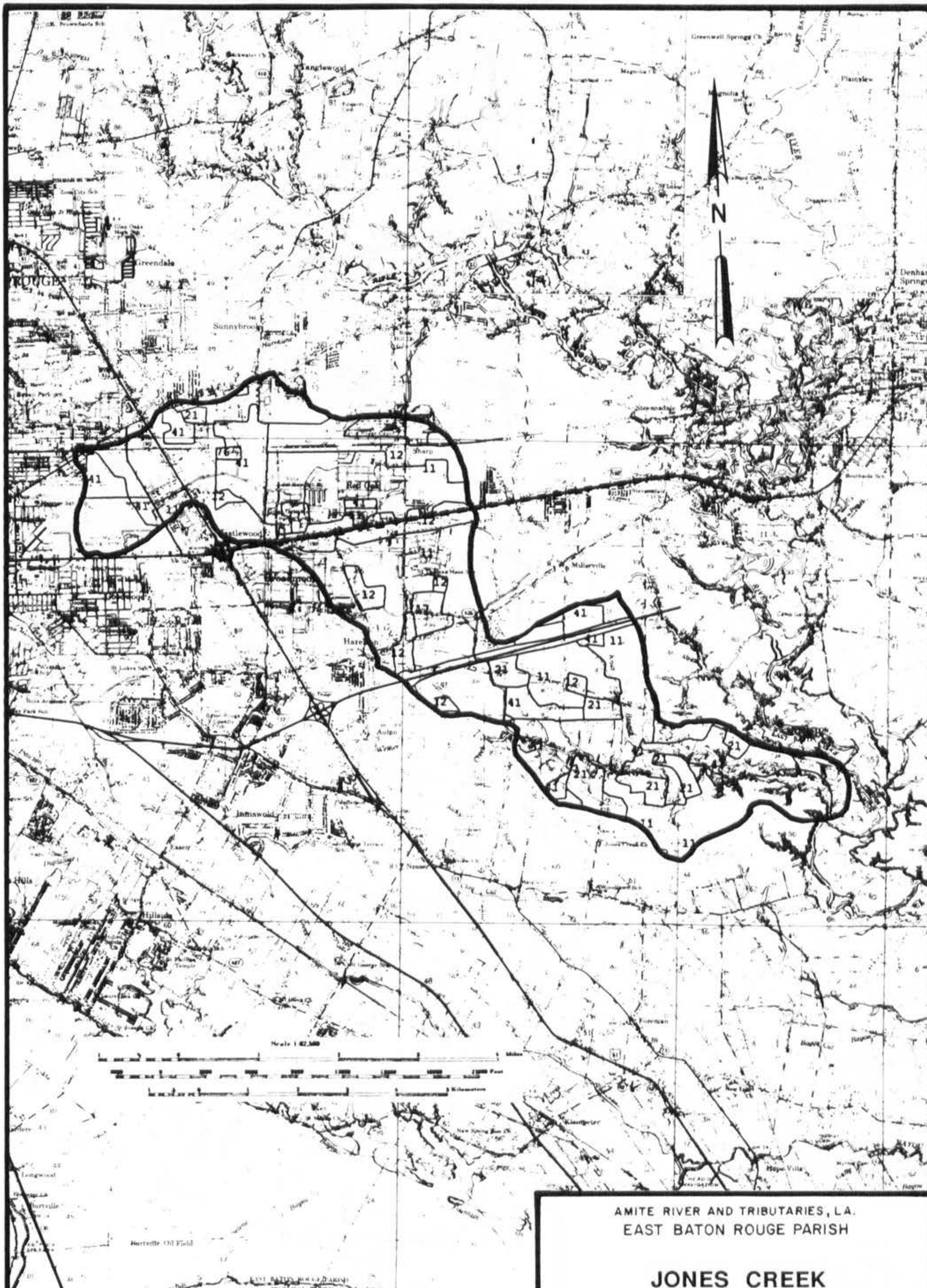
PLATE J-5



AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH

JONES CREEK
1972 LAND USE

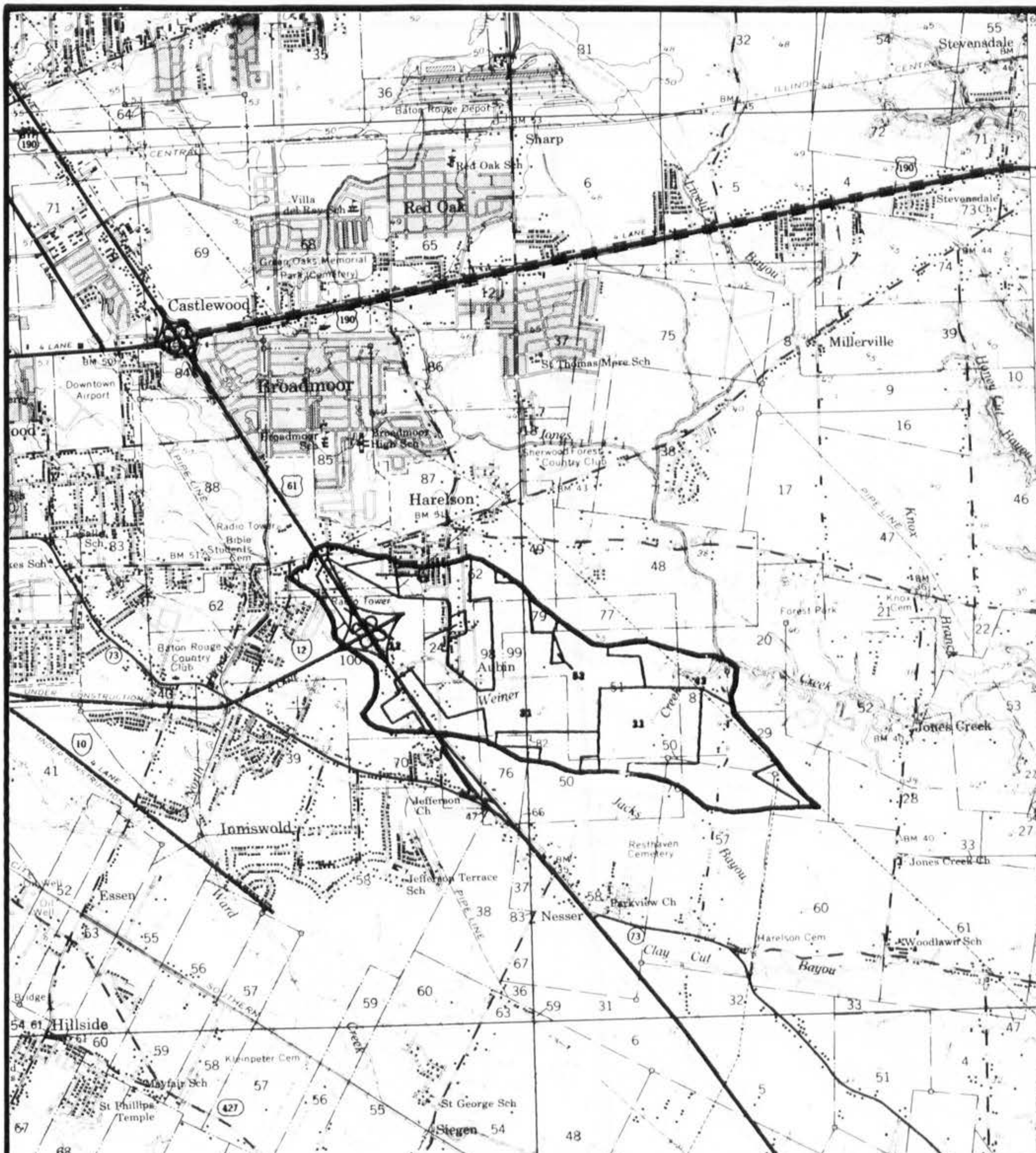
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: SEPTEMBER 1994

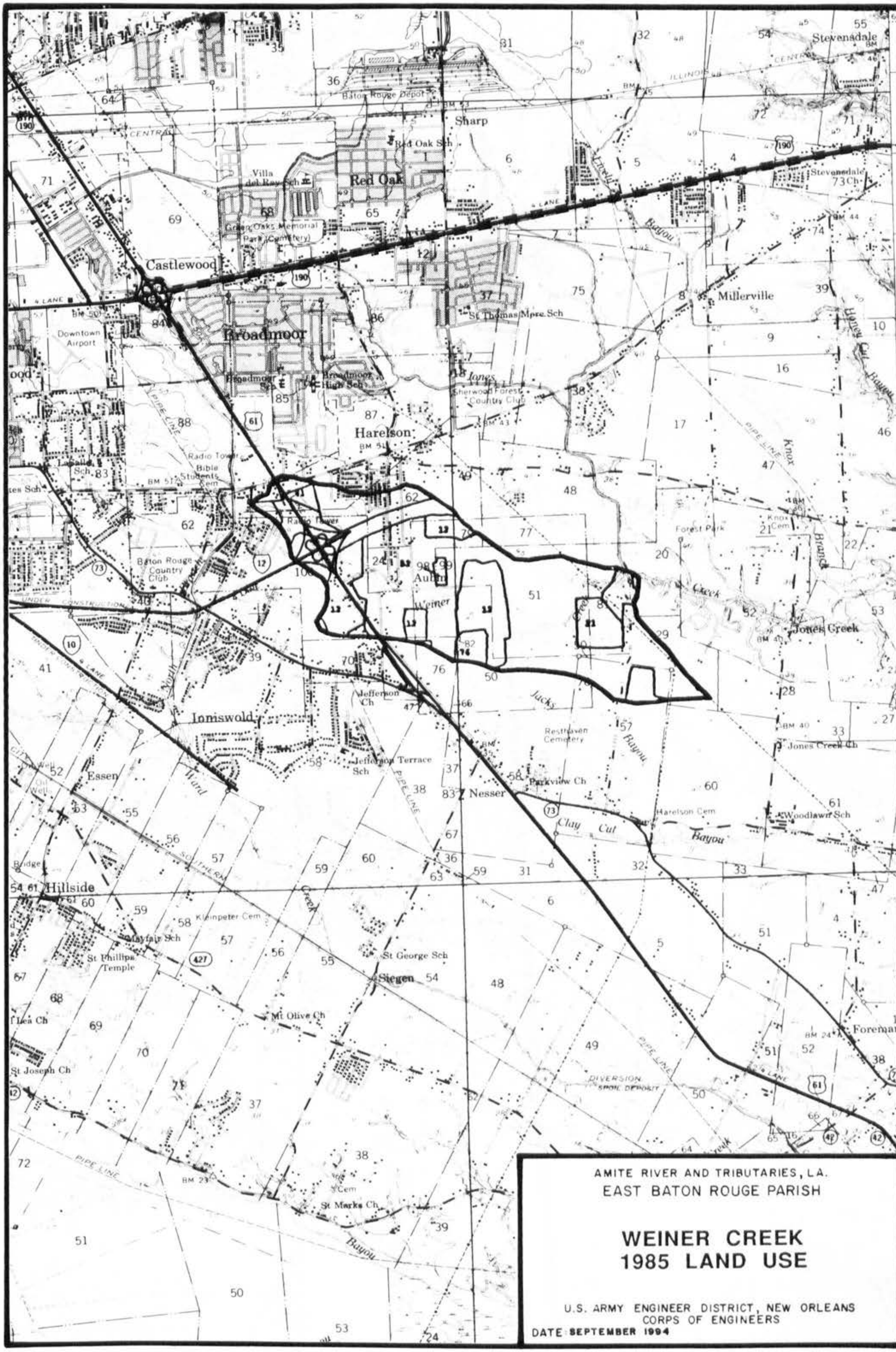


AMITE RIVER AND TRIBUTARIES, L.A.
EAST BATON ROUGE PARISH

JONES CREEK
1985 LAND USE

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE SEPTEMBER 1994


AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH
WEINER CREEK
1972 LAND USE
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE SEPTEMBER 1994
Stevendale
Sharp
Red Oak
Red Oak Sch
Villa del Rey Sch
Green Oaks Memorial Park (Cemetery)
Castlewood
Broadmoor
Broadmoor Sch
Broadmoor High Sch
Downtown Airport
St Thomas More Sch
Millerville
Jones
Sherwood Forest Country Club
Harelson
Radio Tower
Bible Students Cem
LaSalle Sch
Baton Rouge Country Club
Aubin
Weiner
Creek
Forest Park
Knox Cem
Jones Creek
Jones Creek Ch
Jefferson Ch
Inniswold
Restheaven Cemetery
Jacks
Bayou
Jefferson Terrace Sch
Essen
Nesser
Parkview Ch
Harelson Cem
Woodlawn Sch
Clay Cut Bayou
Hillside
Kleinpeter Cem
Mayfair Sch
St Phillips Temple
St George Sch
Siegen
Mt Olive Ch
St Joseph Ch
DIVERSION SPOIL DEPOSIT
St Marks Ch
Foreman
PIPE LINE
UNDER CONSTRUCTION
4 LANE



AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH

WEINER CREEK
1985 LAND USE

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE SEPTEMBER 1994

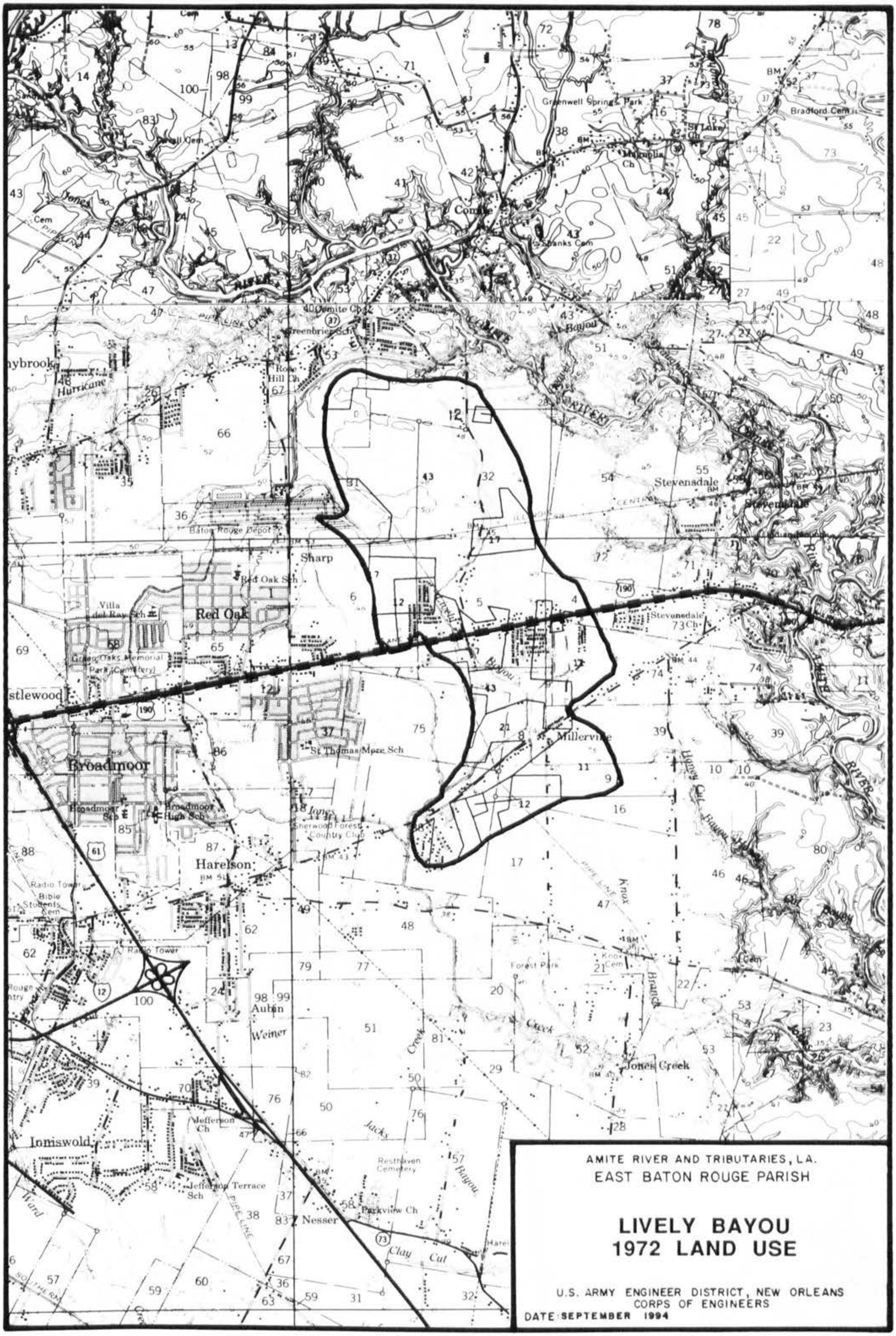
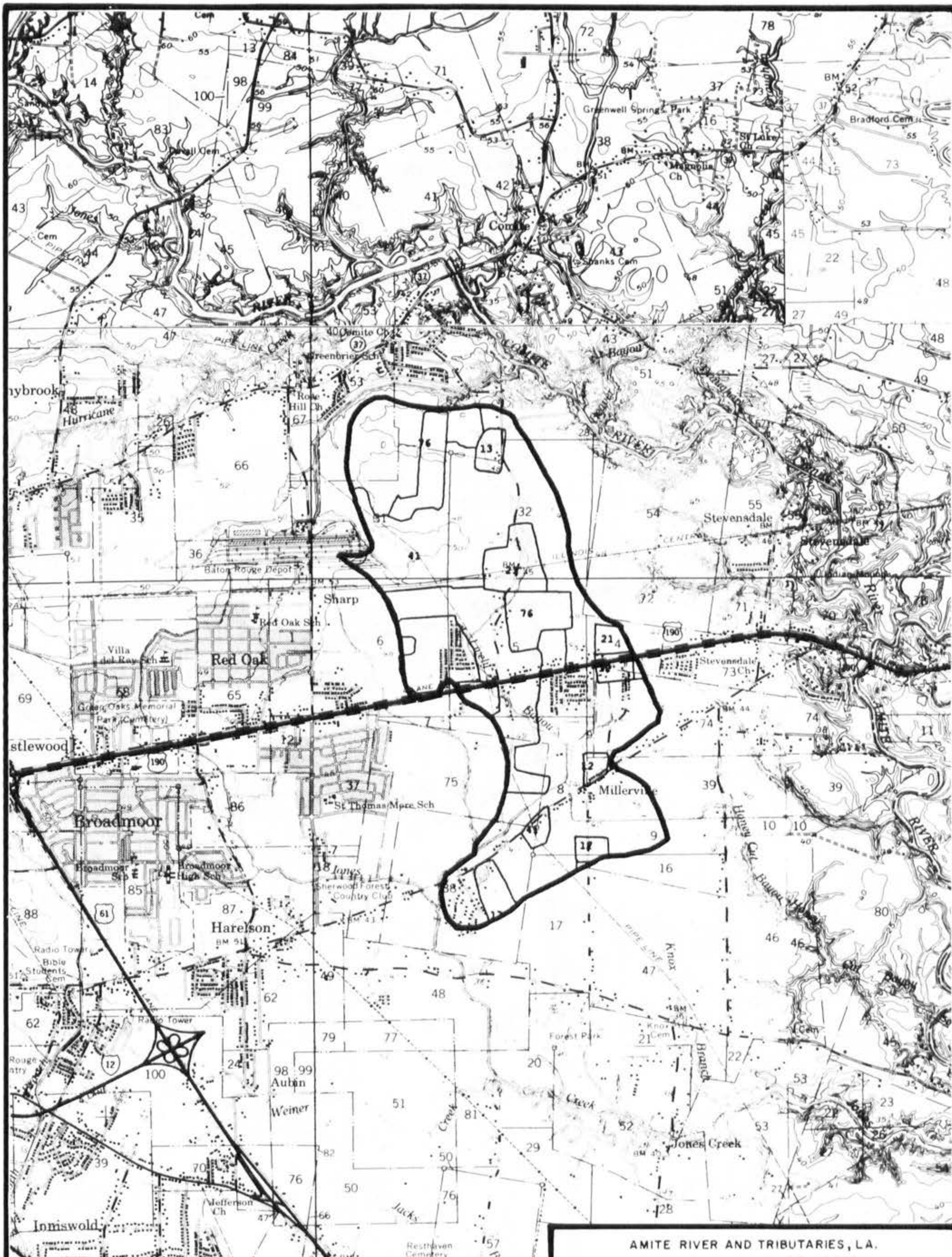

AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH
LIVELY BAYOU
1972 LAND USE
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE SEPTEMBER 1994

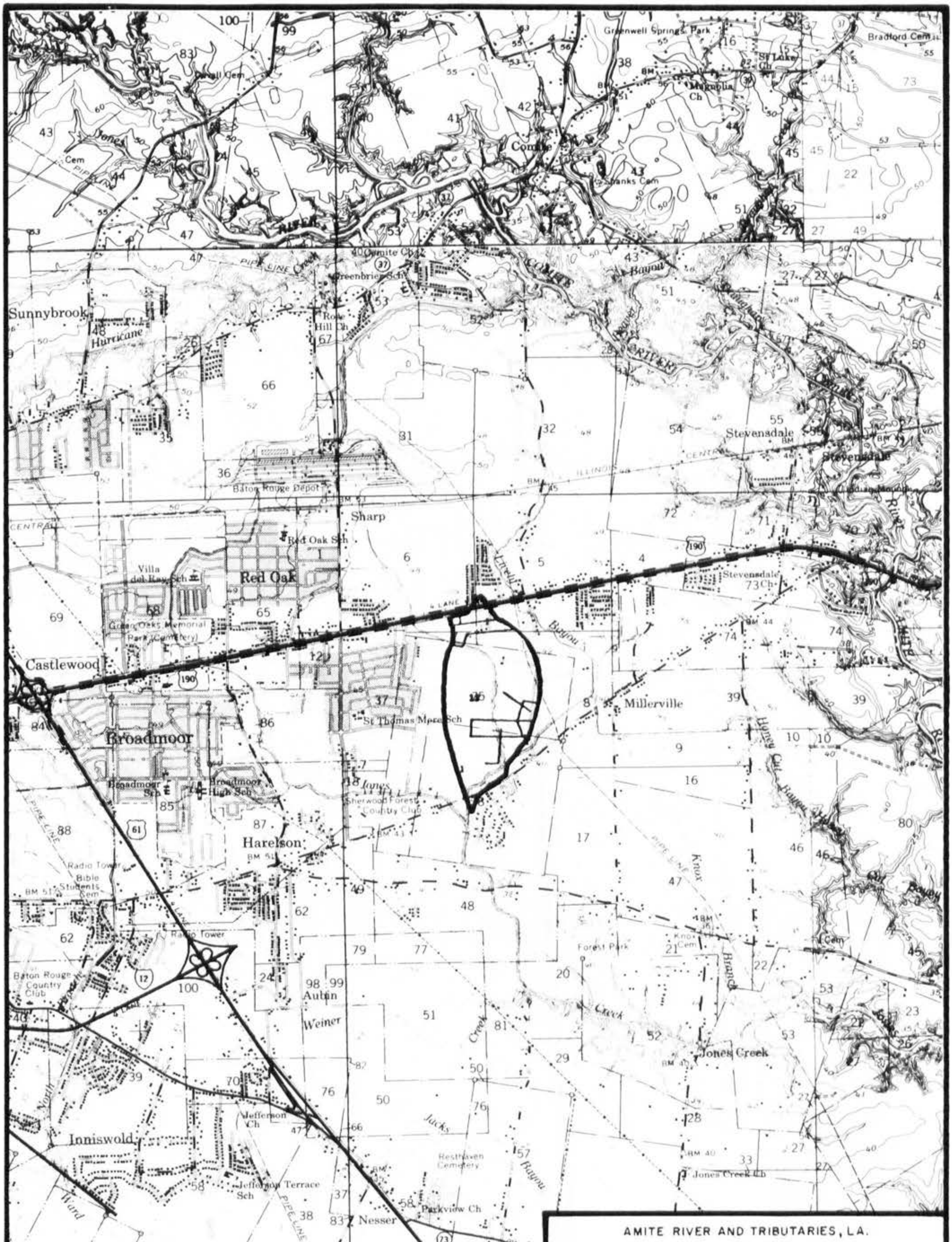
PLATE J-10



AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH

LIVELY BAYOU
1985 LAND USE

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: SEPTEMBER 1994

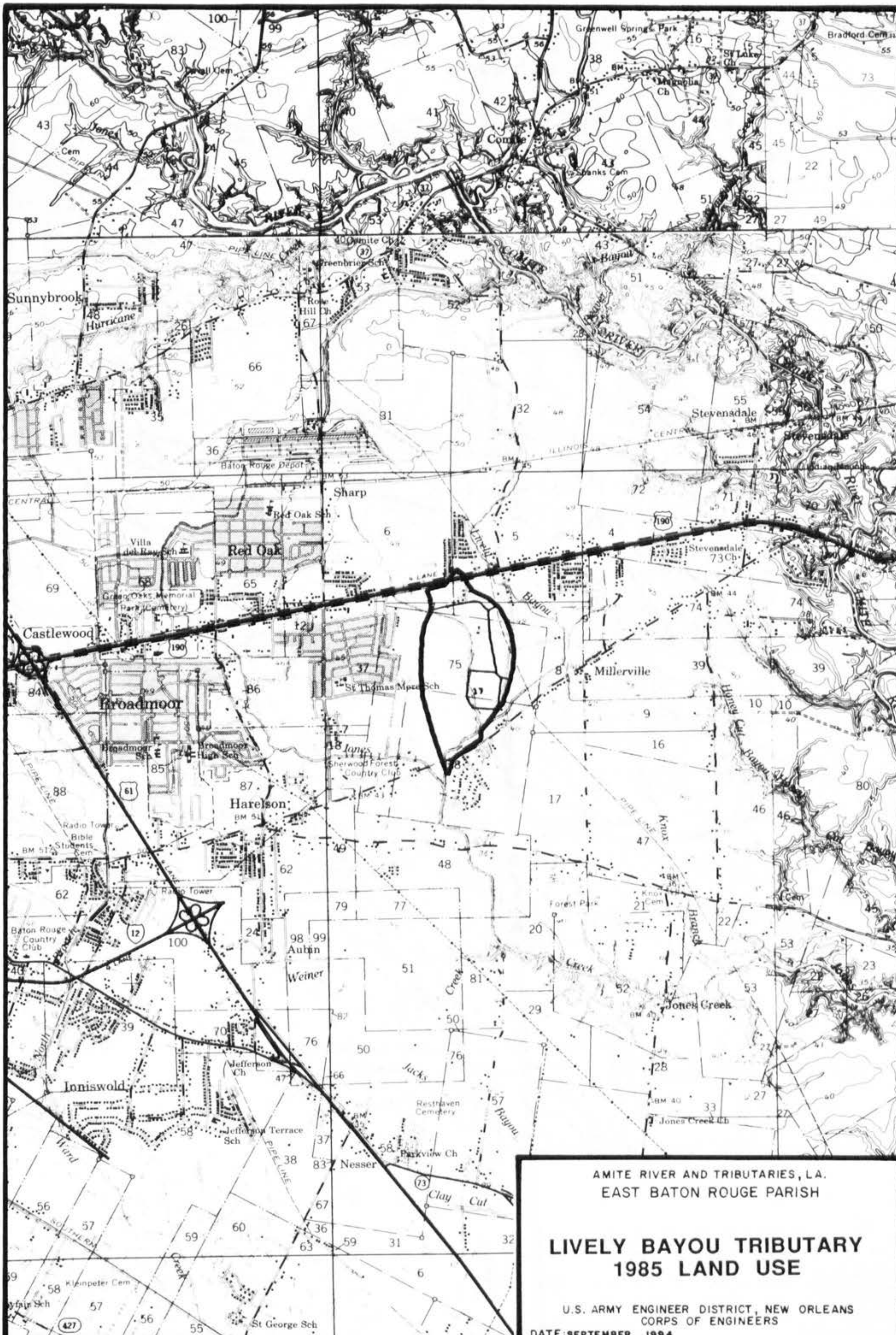


AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH

LIVELY BAYOU TRIBUTARY
1972 LAND USE

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE SEPTEMBER 1994

PLATE J-12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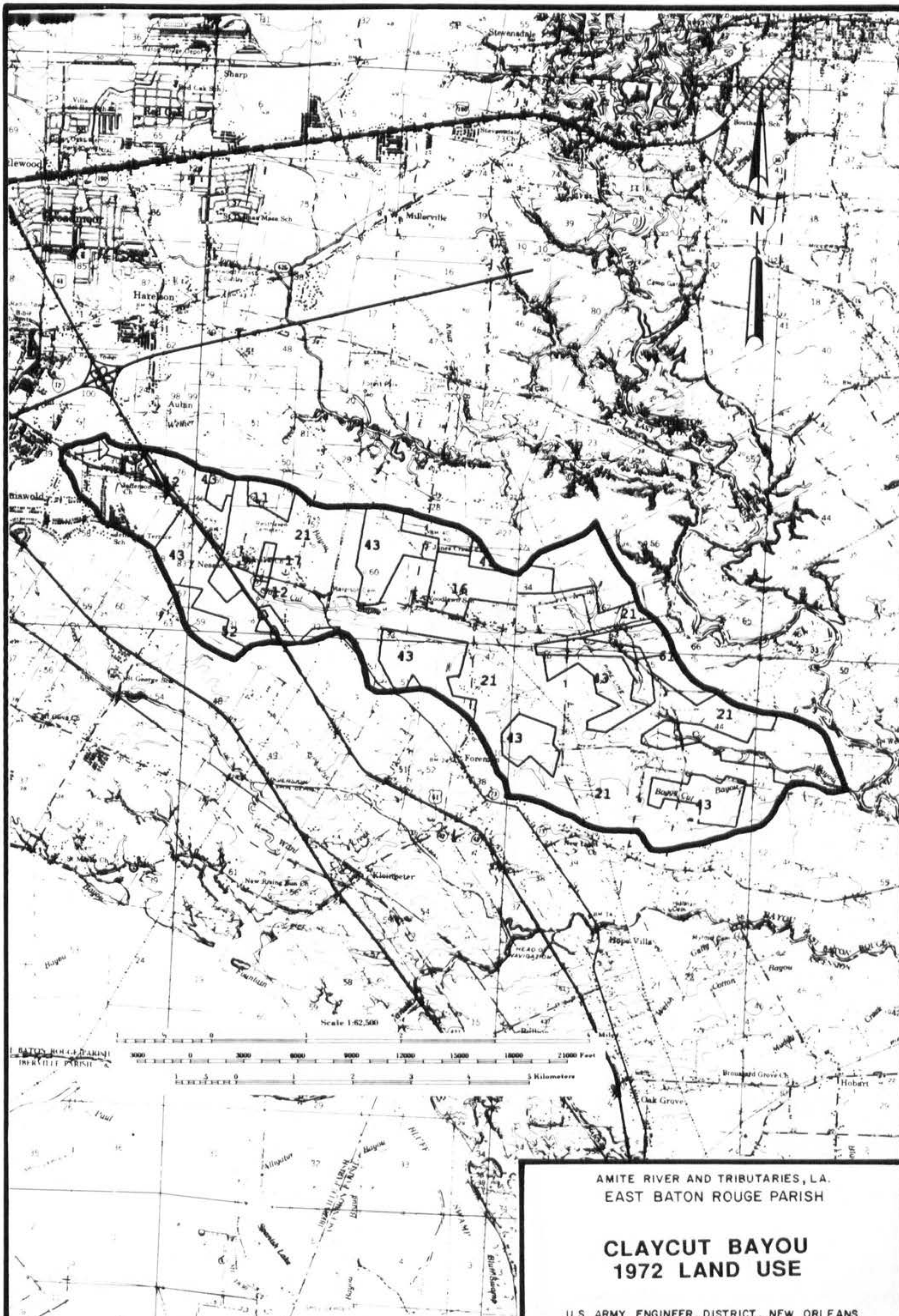
EAST BATON ROUGE PARISH
LIVELY BAYOU TRIBUTARY
1985 LAND USE
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE SEPTEMBER 1994
Sunnybrook
Sharp
Red Oak
Castlewood
Broadmoor
Harelson
Millerville
Stevendale
Inniswold
Nesser
Aubin
Jones Creek
Baton Rouge Depot
Sherwood Forest Country Club
Resthaven Cemetery

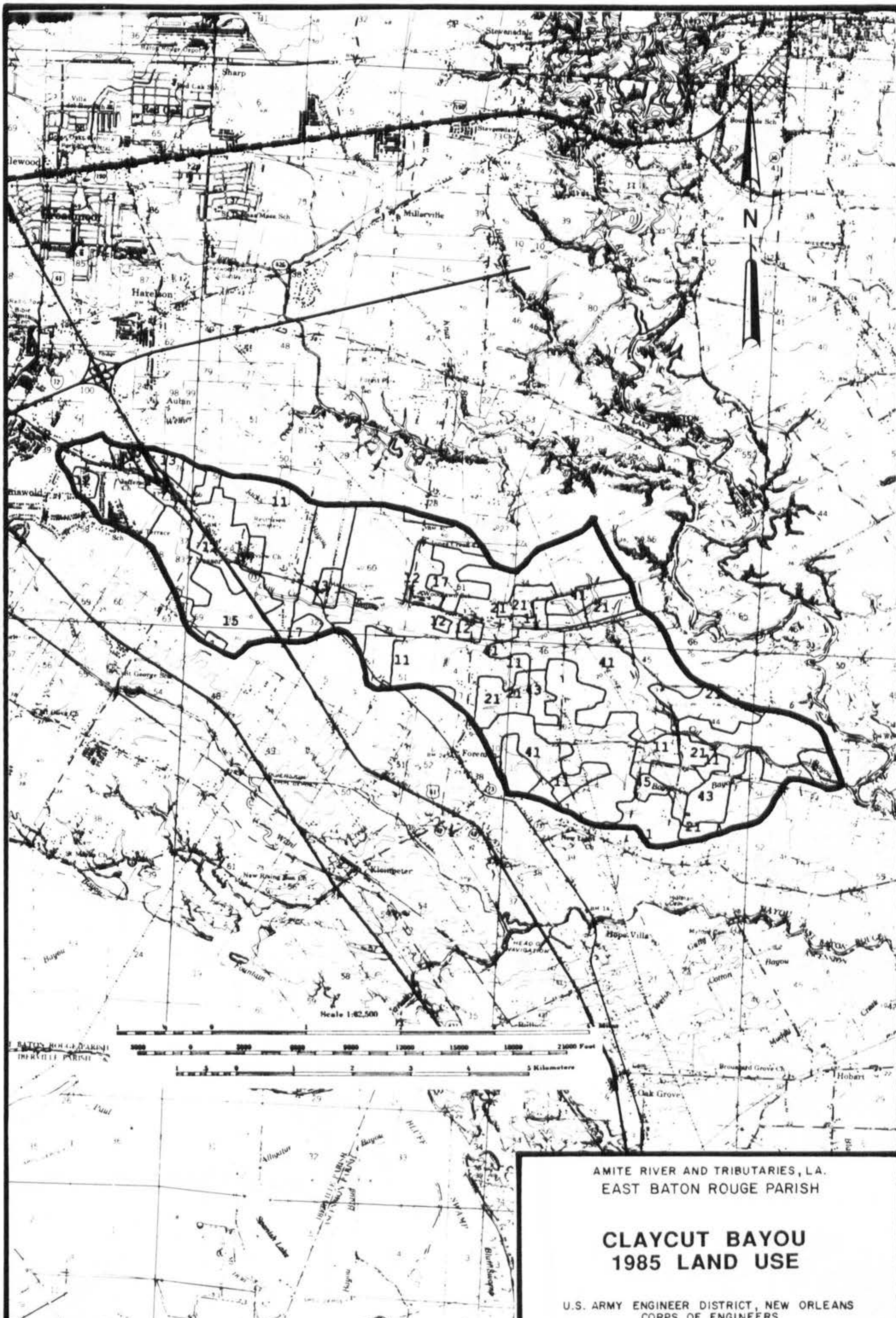
PLATE J-13



AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH

CLAYCUT BAYOU
1972 LAND USE

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: SEPTEMBER 1994

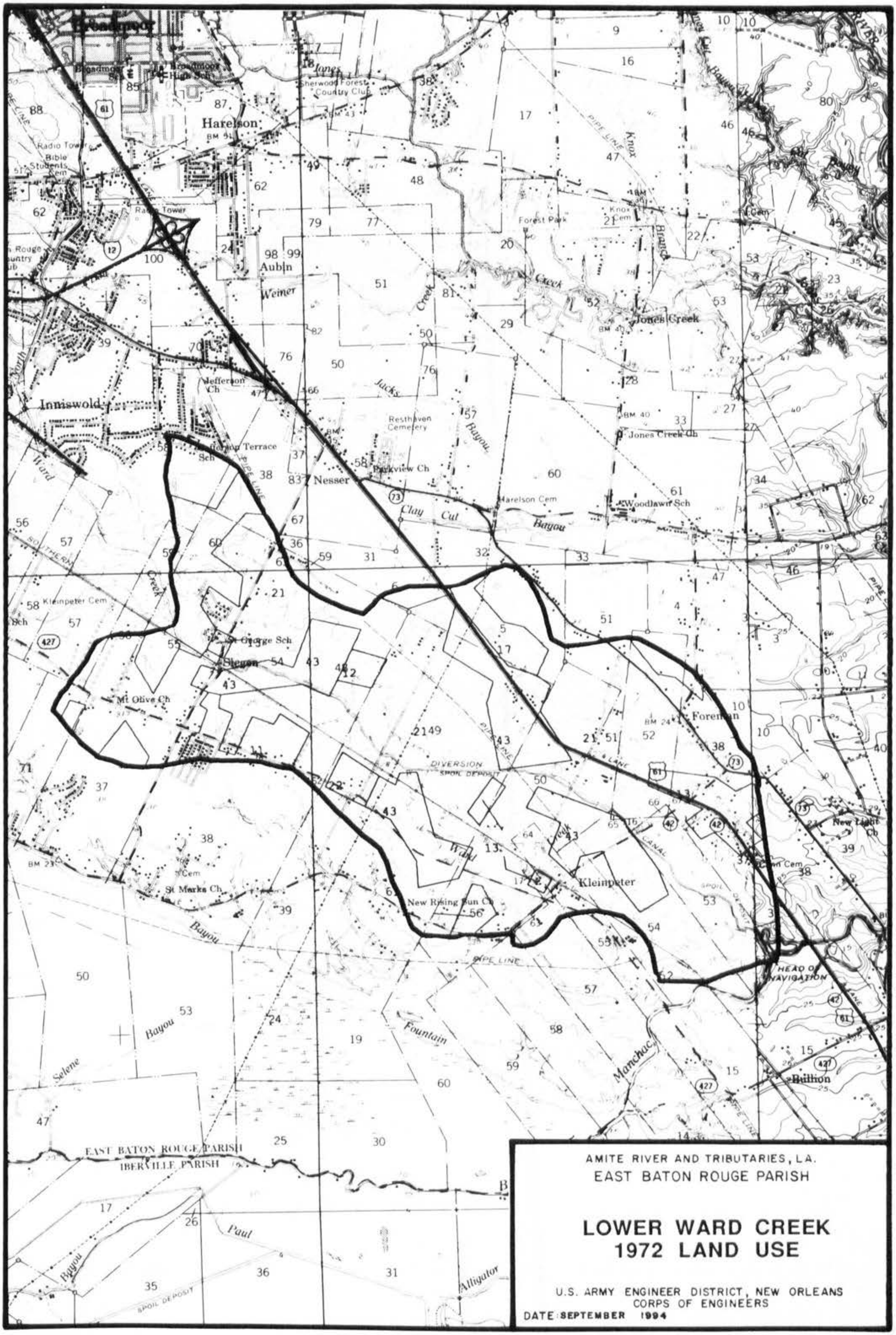


AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH

CLAYCUT BAYOU
1985 LAND USE

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: SEPTEMBER 1994

PLATE J-15


AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH
LOWER WARD CREEK
1972 LAND USE
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: SEPTEMBER 1994
Broadmoor
Harelson
Aubin
Inniswold
Nesser
Siegen
Kleinpeter
Foreman
Jones Creek
Forest Park
EAST BATON ROUGE PARISH
IBERVILLE PARISH
HEAD OF NAVIGATION

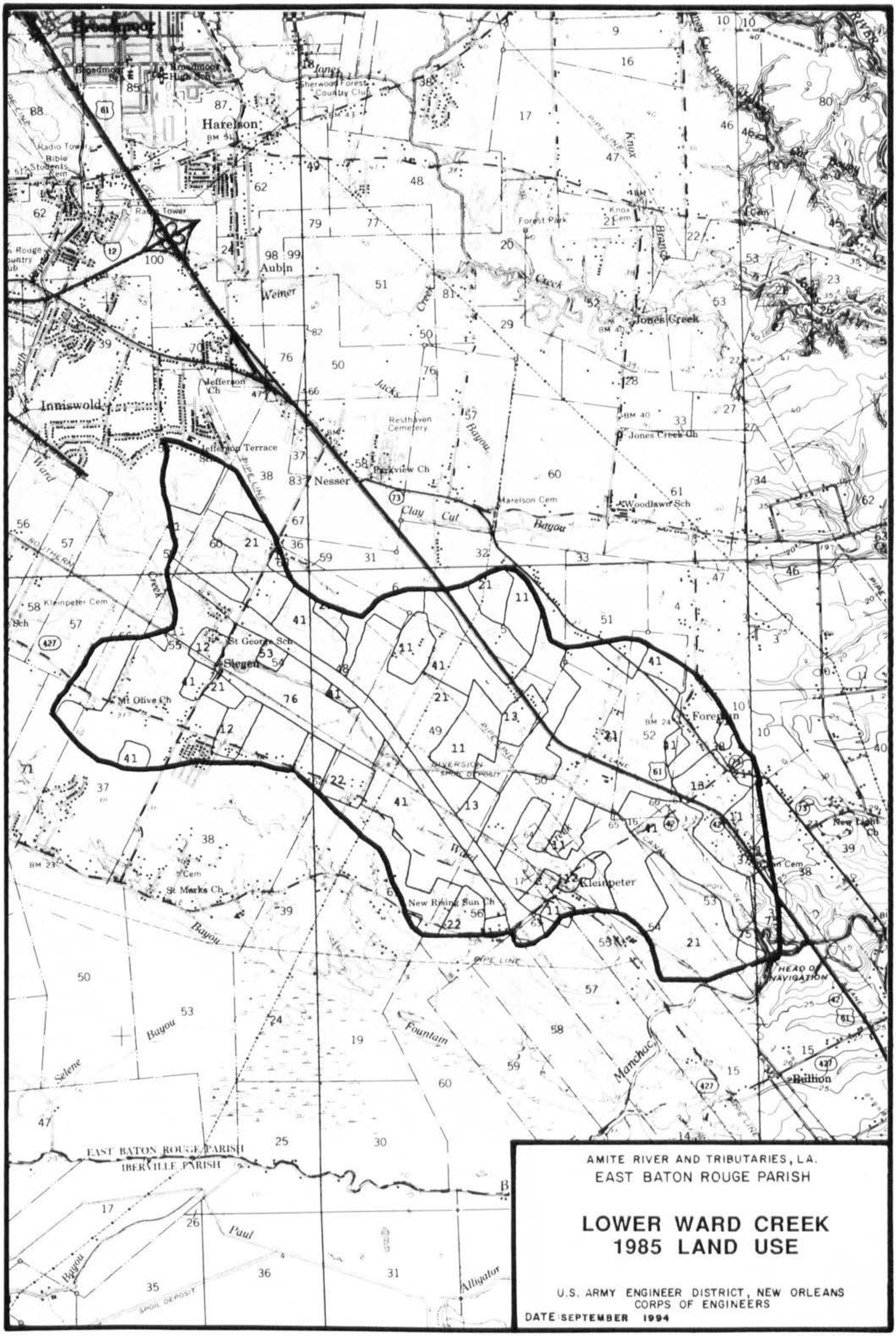
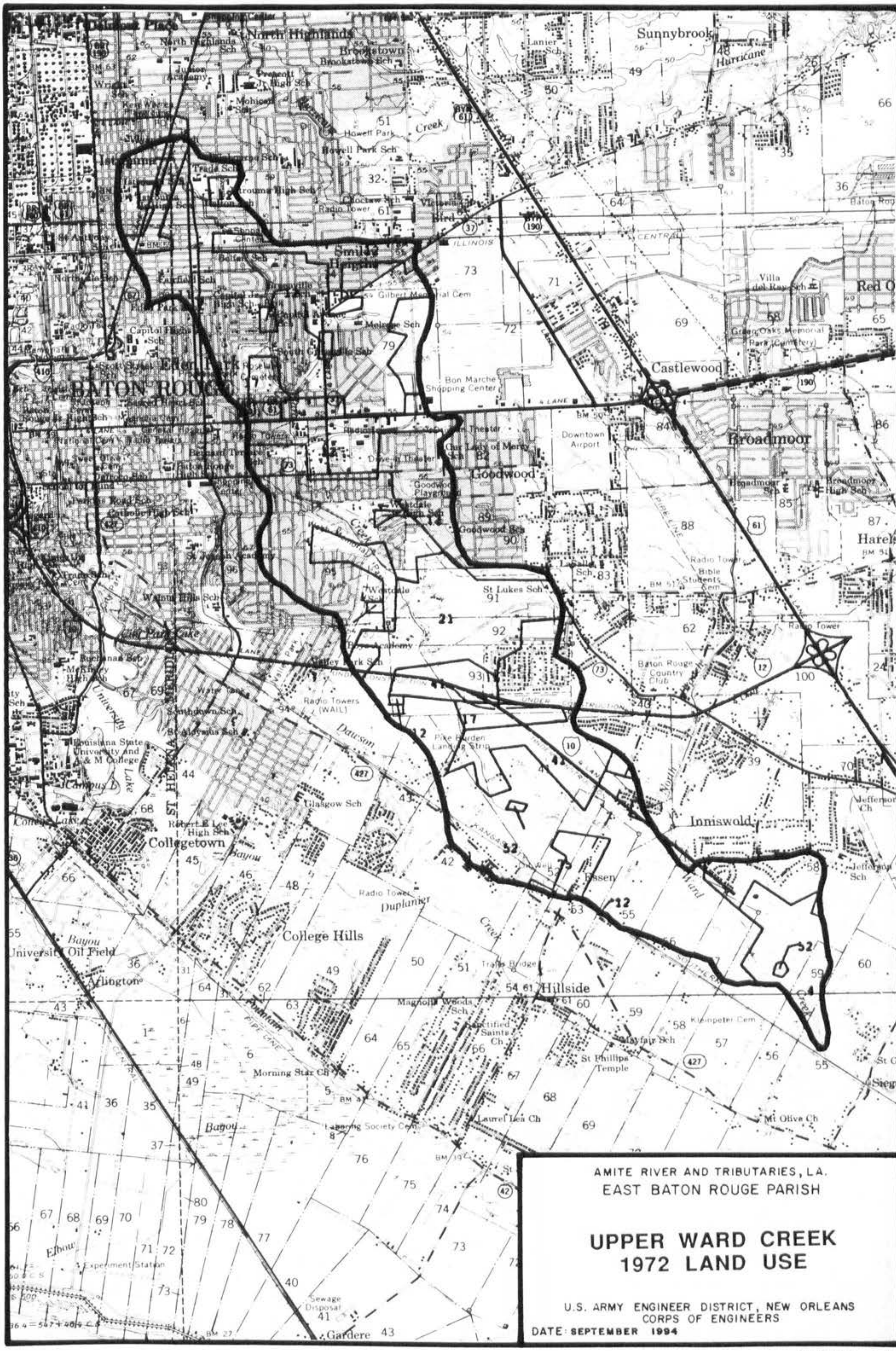

AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH
LOWER WARD CREEK
1985 LAND USE
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: SEPTEMBER 1994
Broadmoor
Harelson
Aubin
Inniswold
Jefferson Terrace
Nesser
Siegen
Forest Park
Jones Creek
Resthaven Cemetery
Parkview Ch
Clay Cut Bayou
Harelson Cem
Woodlawn Sch
Jones Creek Ch
Kleinpeter Cem
St George Sch
Mt Olive Ch
Foreman
Kleinpeter
New Rising Sun Ch
St Marks Ch
DIVERSION SPOIL DEPOSIT
HEAD OF NAVIGATION
Bayou Fountain
Manchac
Selene Bayou
Bullion
New Light Ch
EAST BATON ROUGE PARISH
IBERVILLE PARISH
Paul
Alligator
SPOIL DEPOSIT

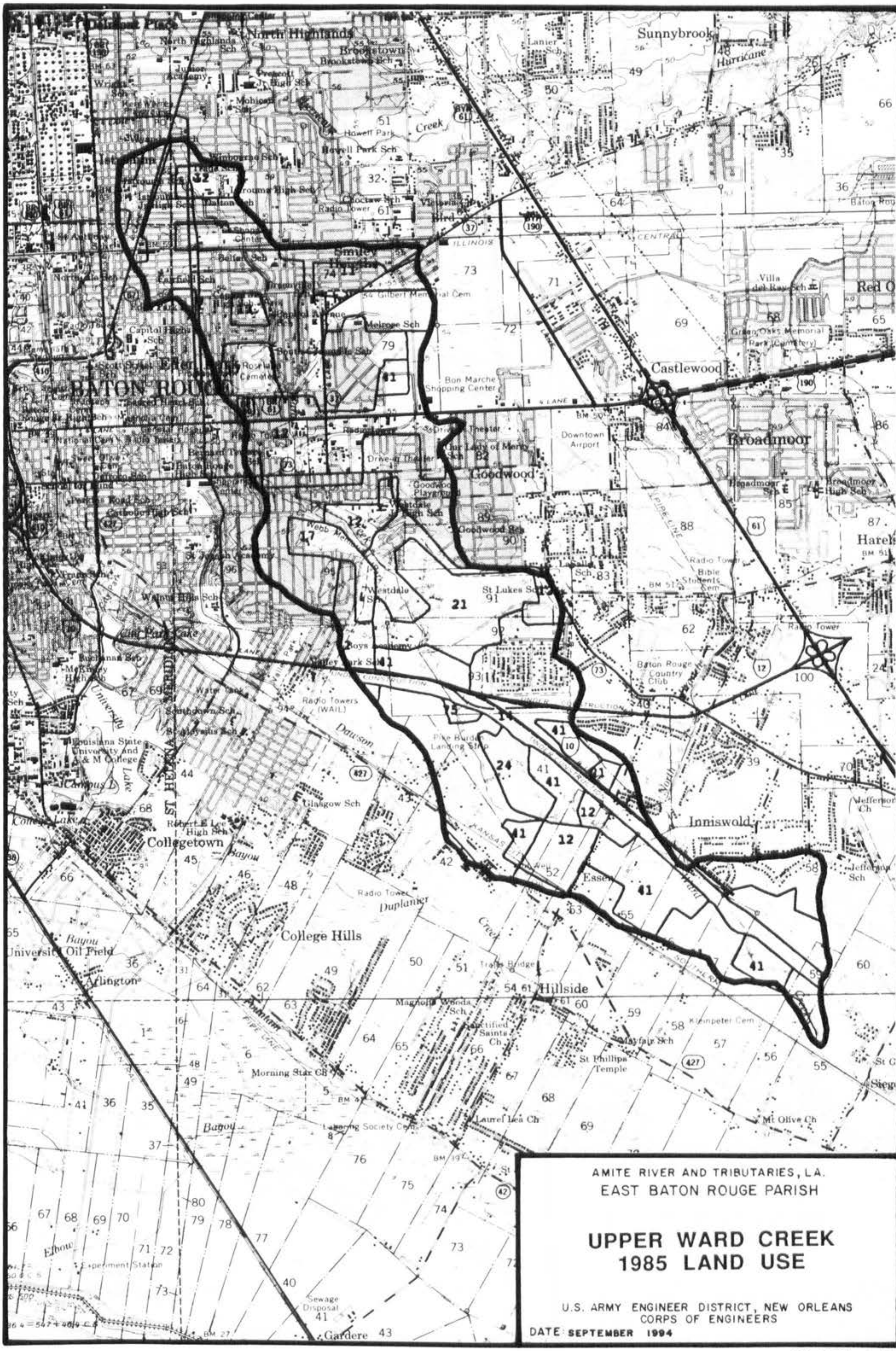
PLATE J-17



AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH

UPPER WARD CREEK
1972 LAND USE

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: SEPTEMBER 1994



AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH

UPPER WARD CREEK 1985 LAND USE

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS

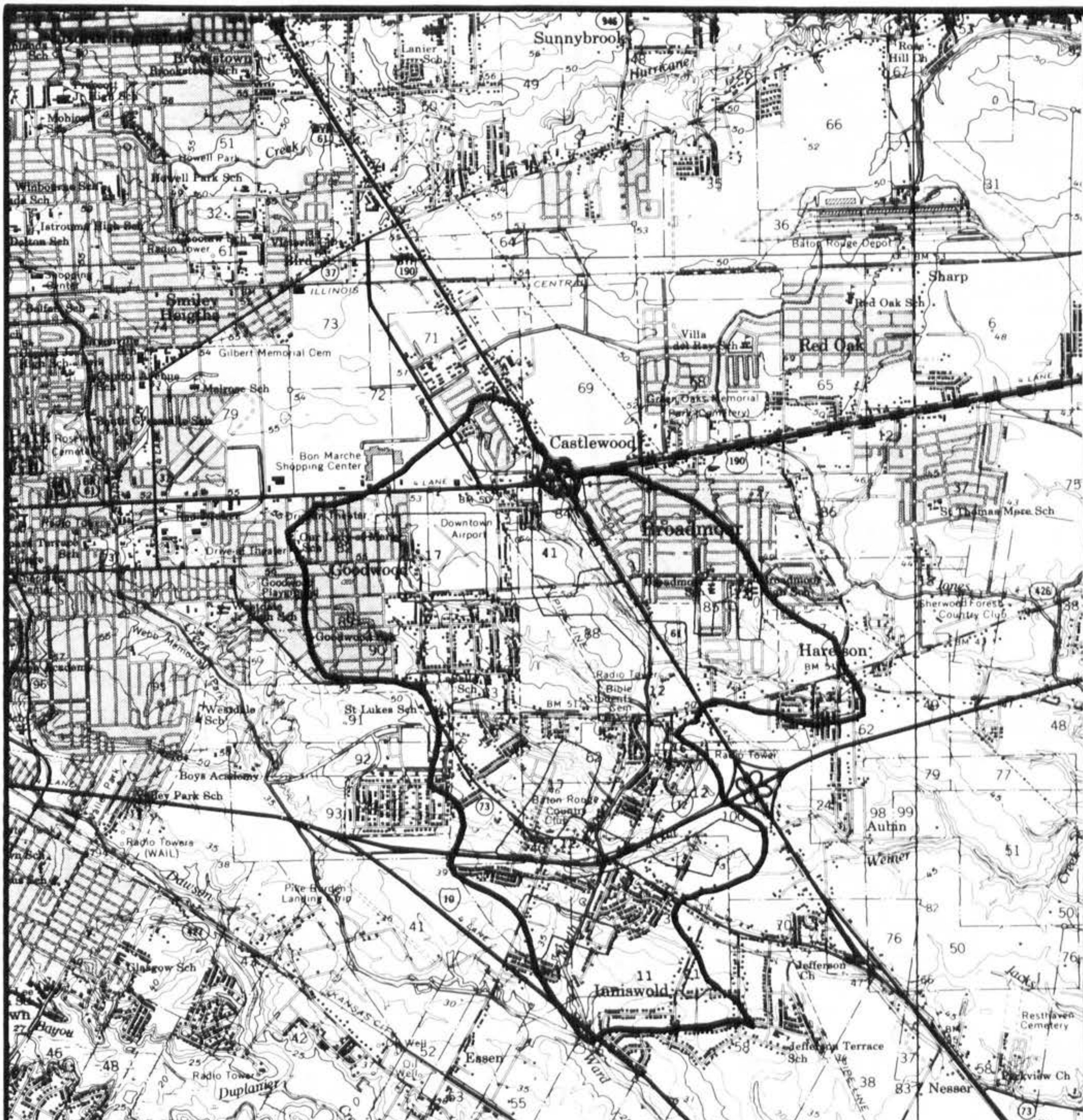
DATE SEPTEMBER 1994

PLATE J-19

AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH

NORTH BRANCH OF WARD CREEK 1972 LAND USE

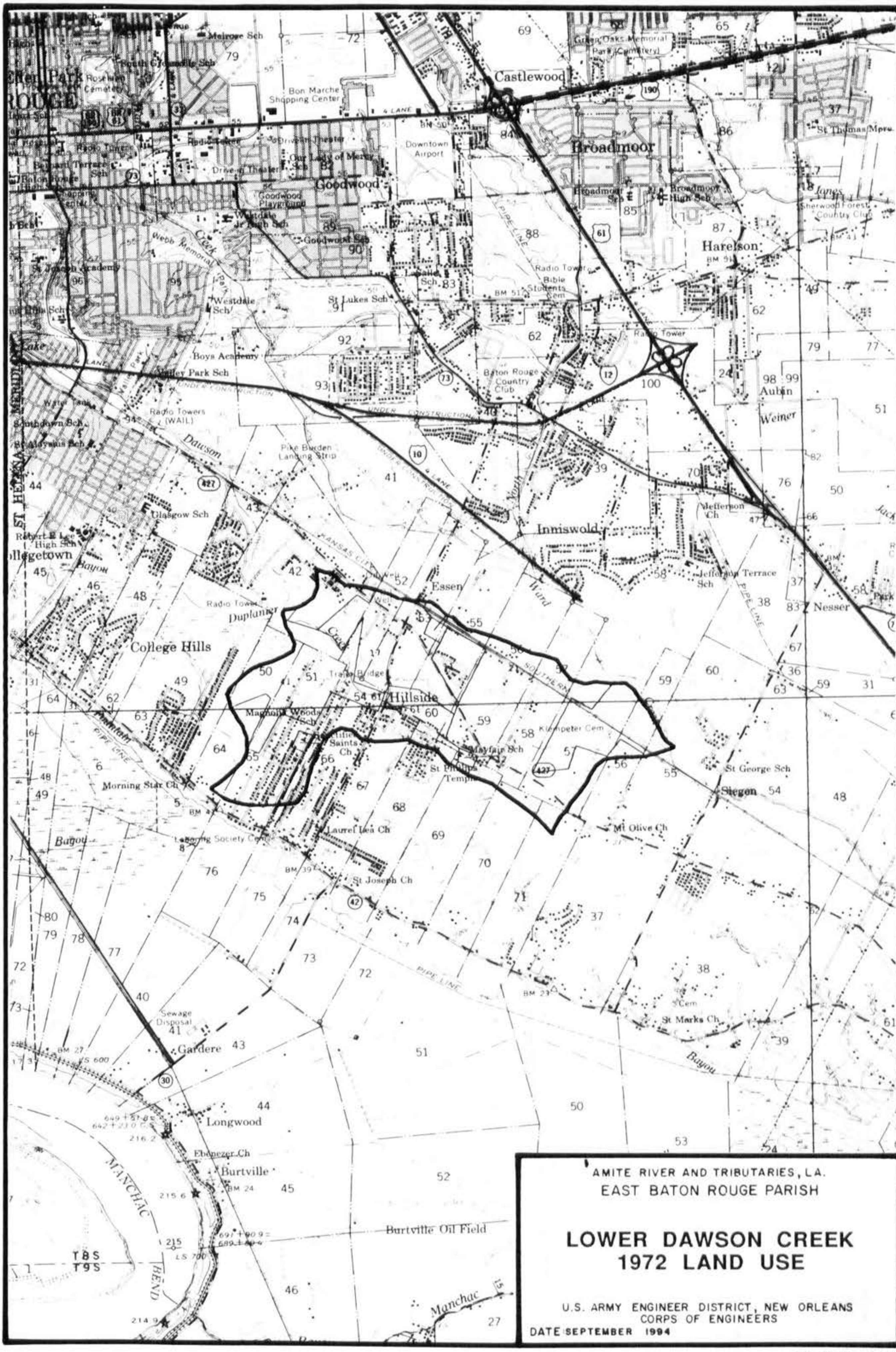
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE SEPTEMBER 1994



AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH

NORTH BRANCH OF WARD CREEK 1985 LAND USE

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE SEPTEMBER 1994



AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH

LOWER DAWSON CREEK 1972 LAND USE

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE SEPTEMBER 1994

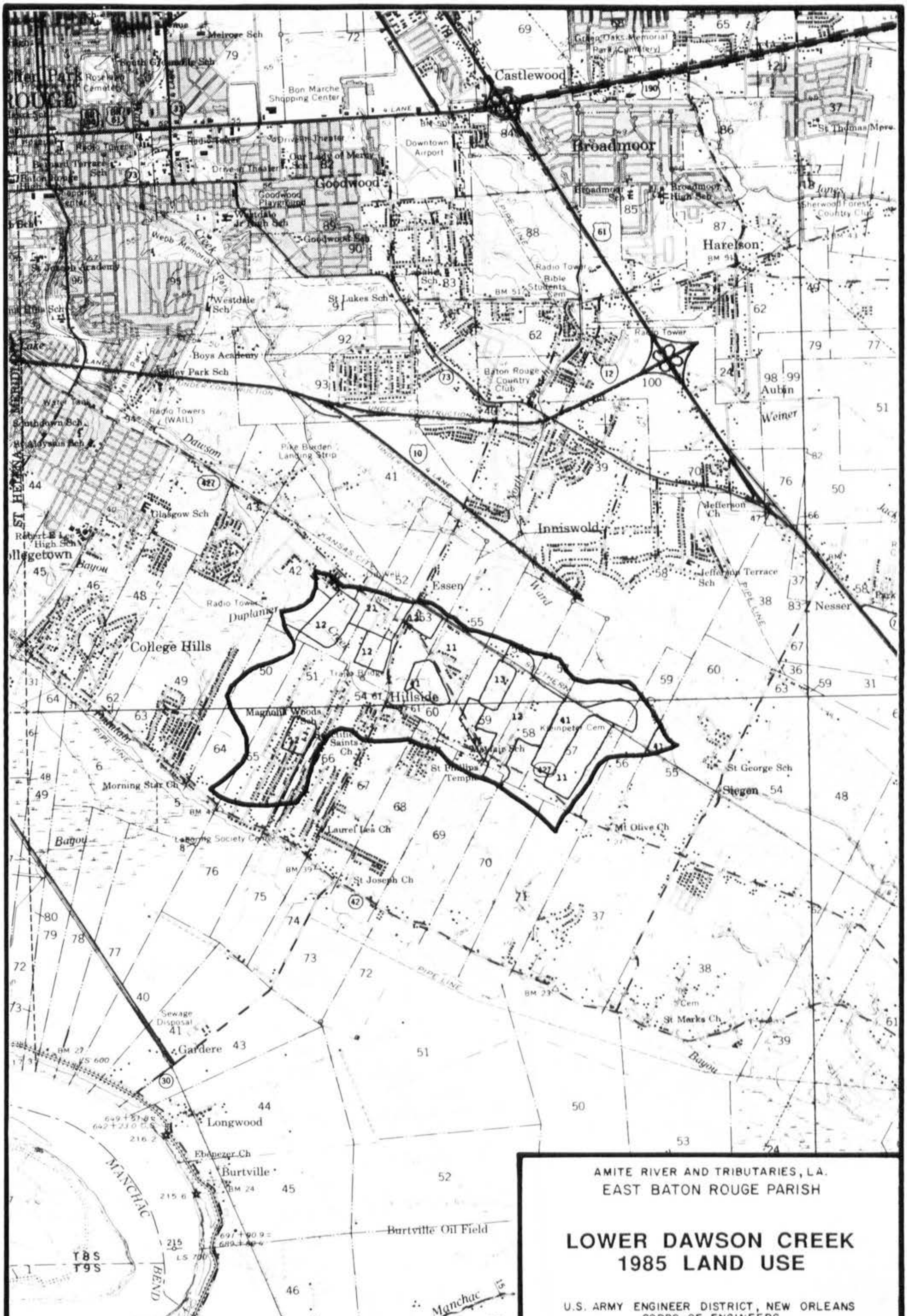
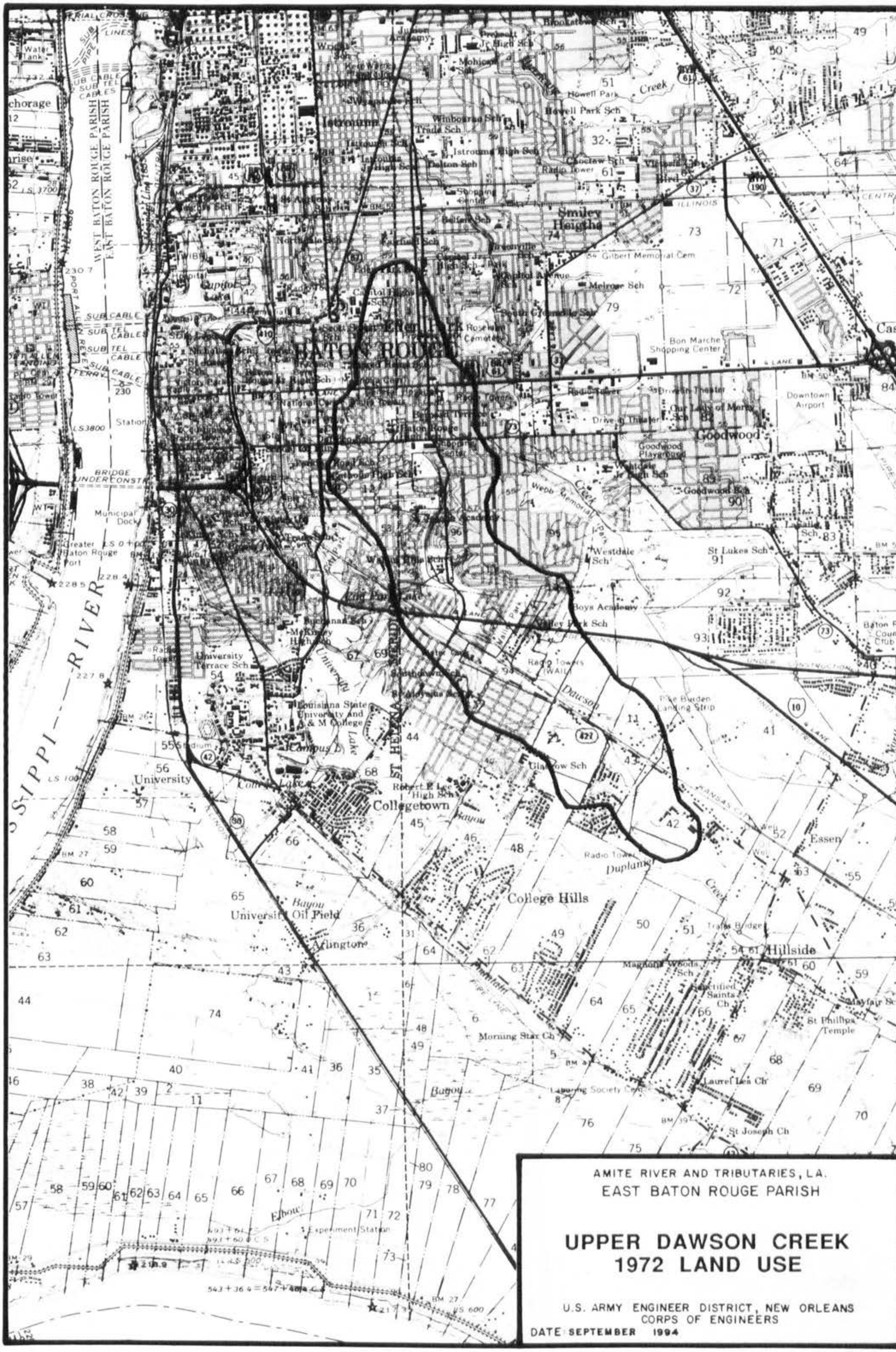
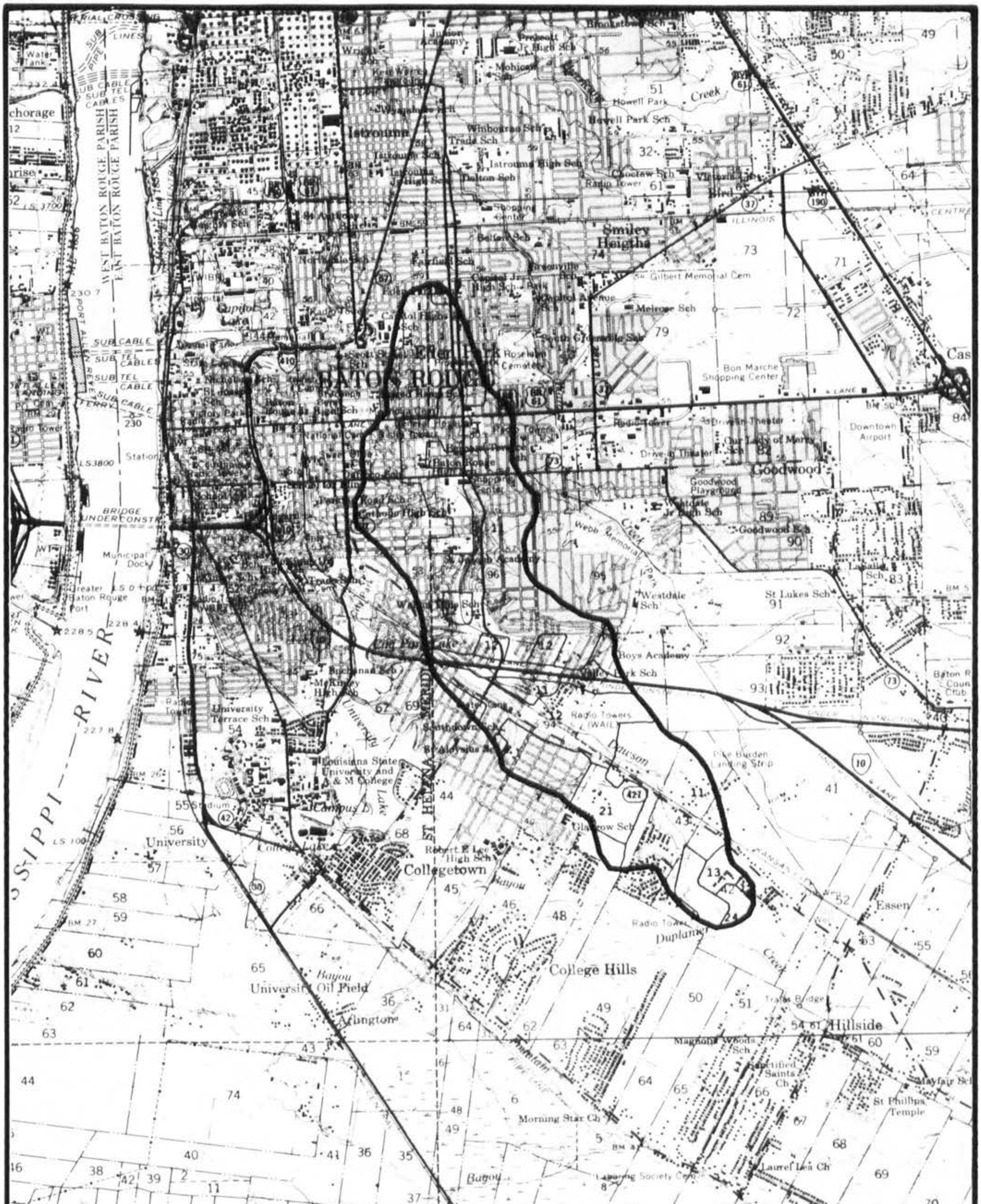

AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH
LOWER DAWSON CREEK
1985 LAND USE
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE SEPTEMBER 1994

PLATE J-23

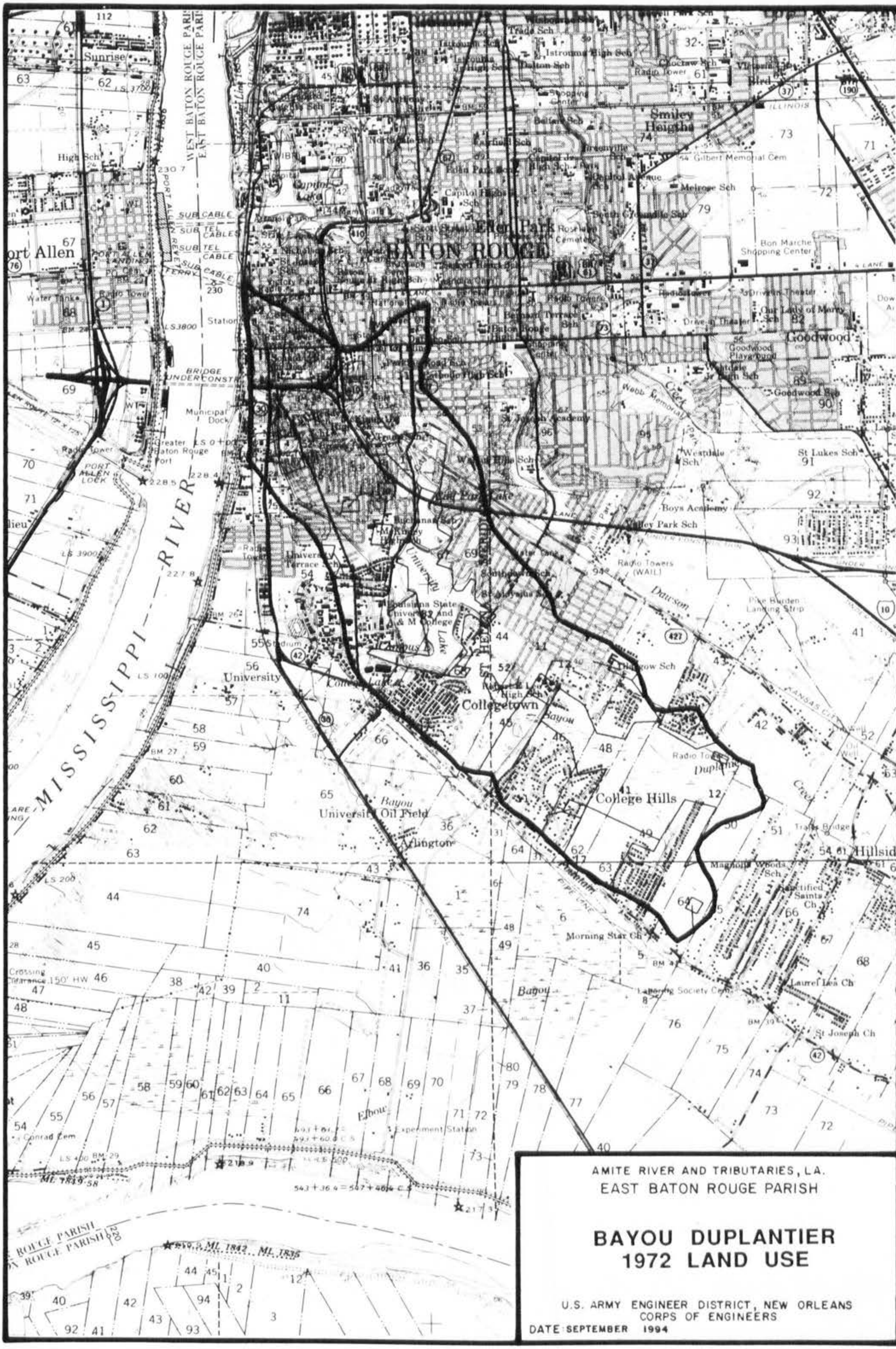

AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH
UPPER DAWSON CREEK
1972 LAND USE
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: SEPTEMBER 1994
BATON ROUGE
MISSISSIPPI RIVER
Dawson Creek
Collegetown
College Hills
Goodwood
University
Hillside
Essen
Louisiana State University and A & M College



AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH

UPPER DAWSON CREEK
1985 LAND USE

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE SEPTEMBER 1994

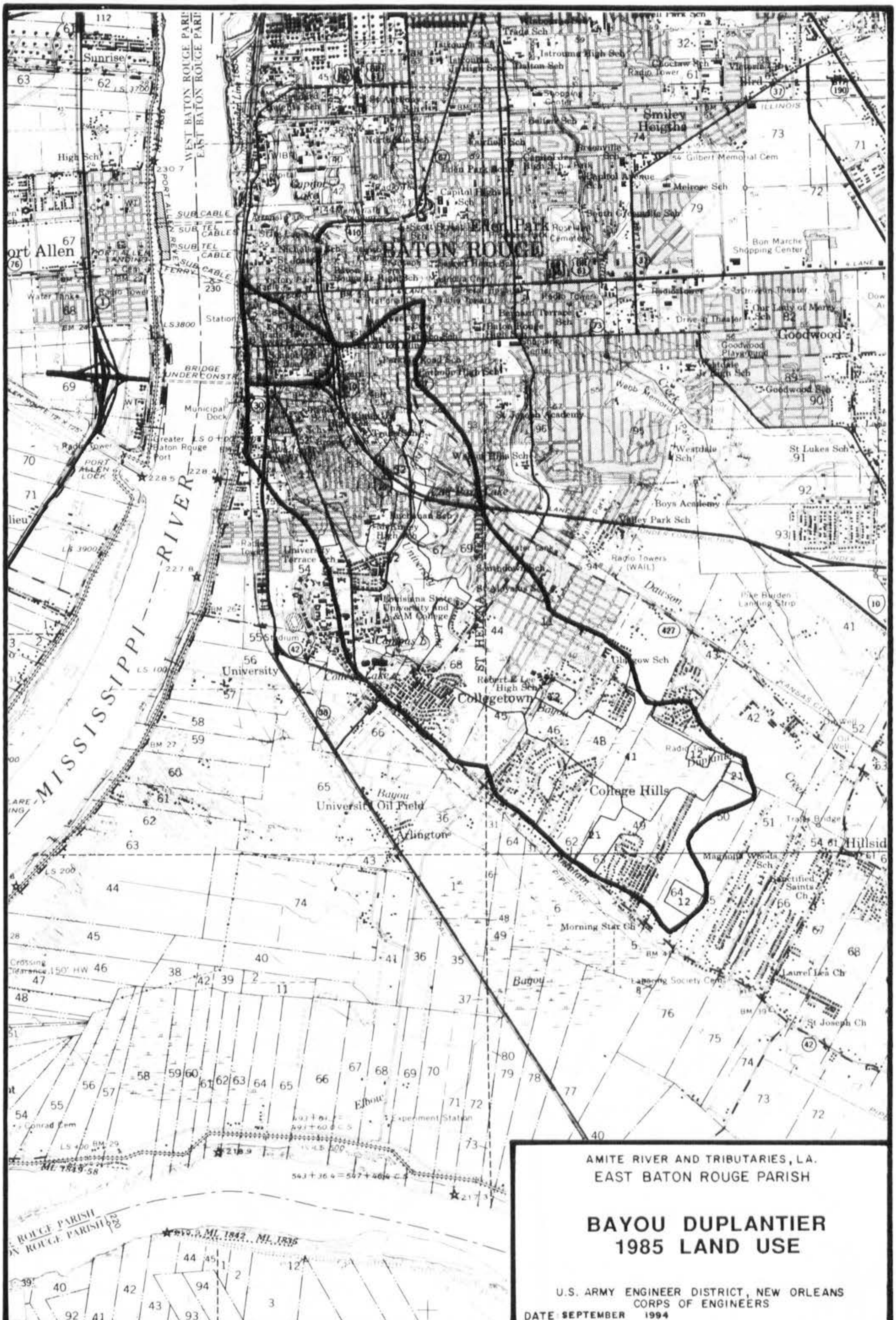


AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH

BAYOU DUPLANTIER
1972 LAND USE

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: SEPTEMBER 1994

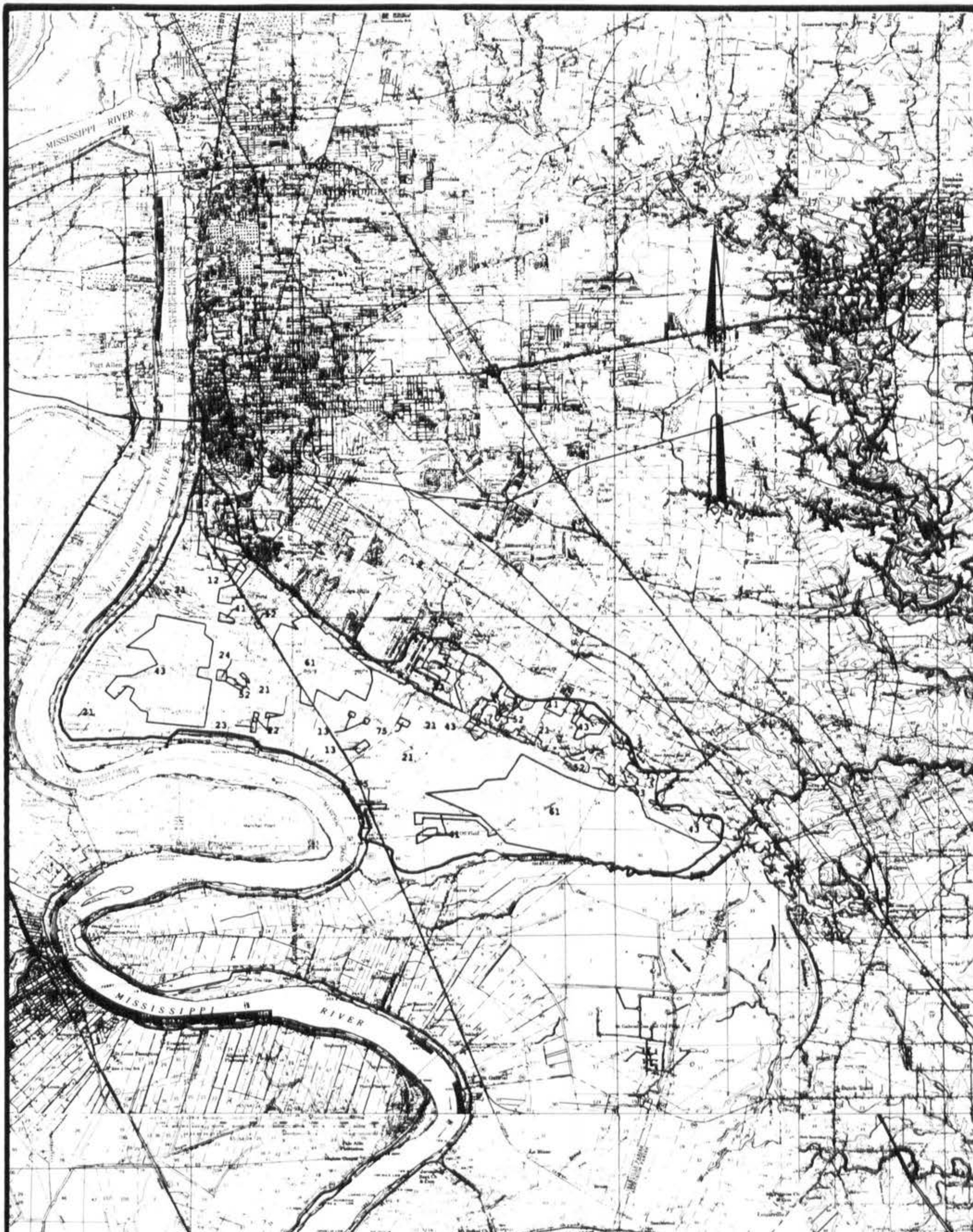
PLATE J-26



AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH

BAYOU DUPLANTIER
1985 LAND USE

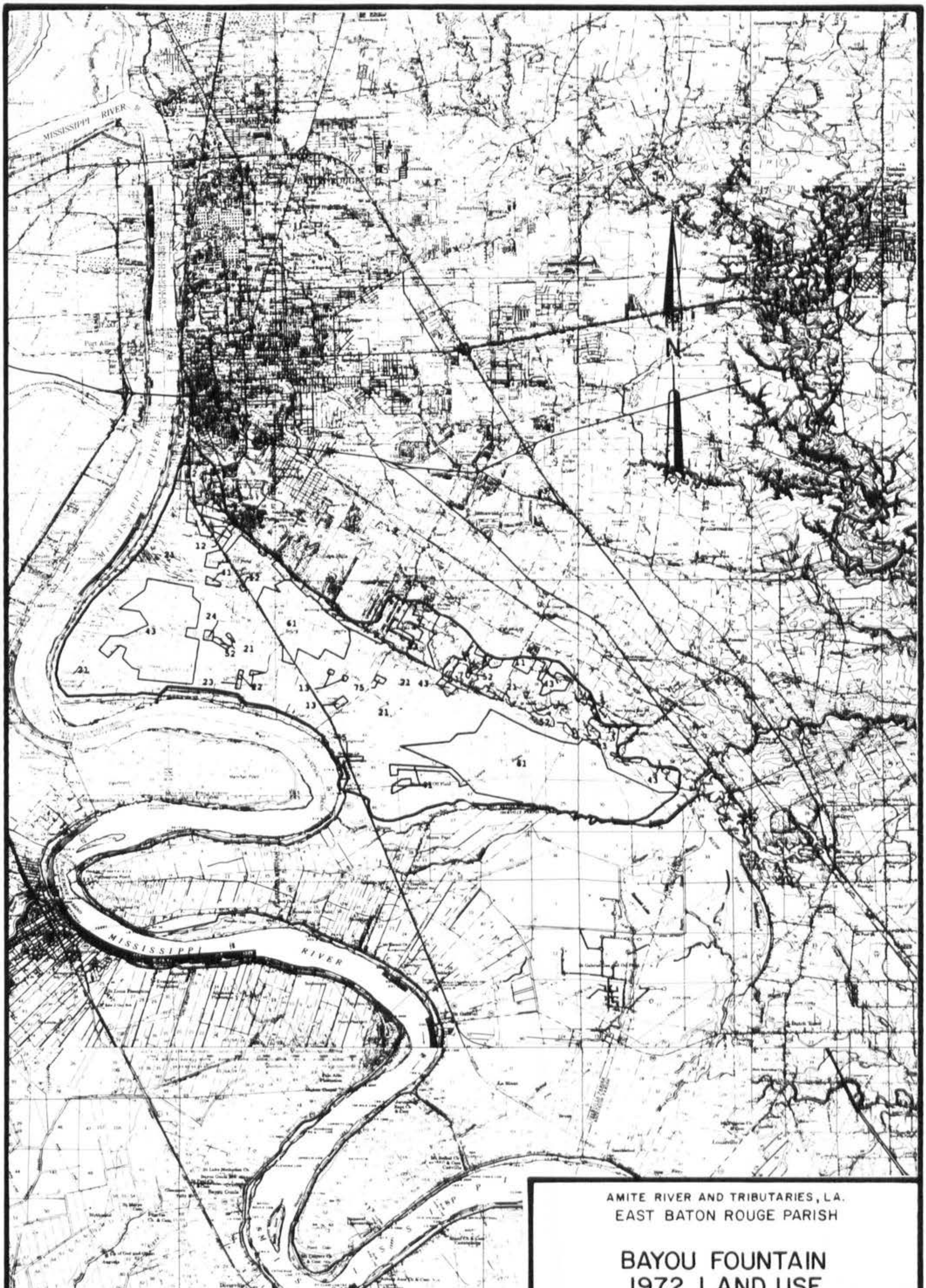
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: SEPTEMBER 1994



AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH

BAYOU FOUNTAIN
1972 LAND USE

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: SEPTEMBER 1994



AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH

BAYOU FOUNTAIN 1972 LAND USE

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: SEPTEMBER 1994

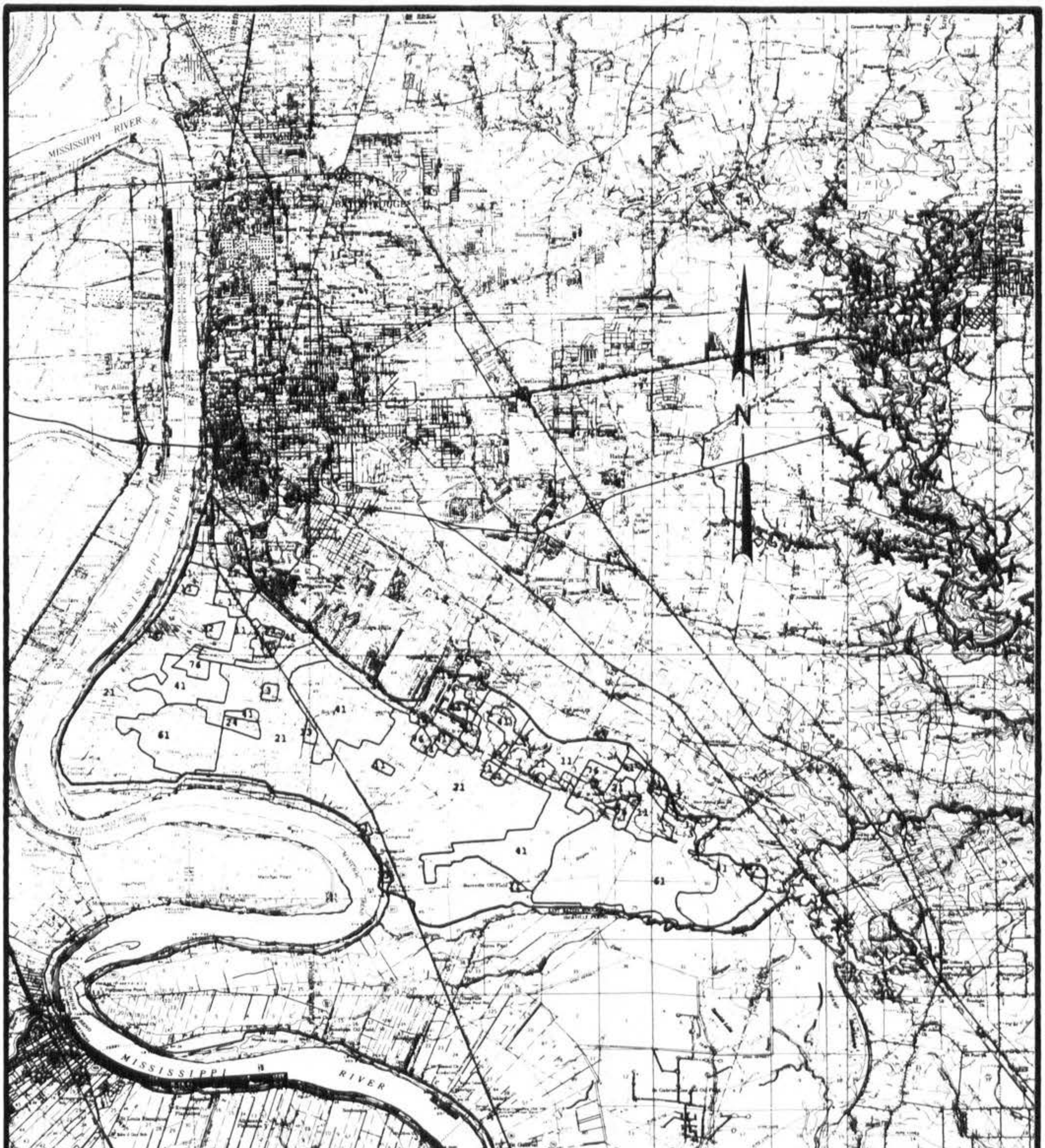
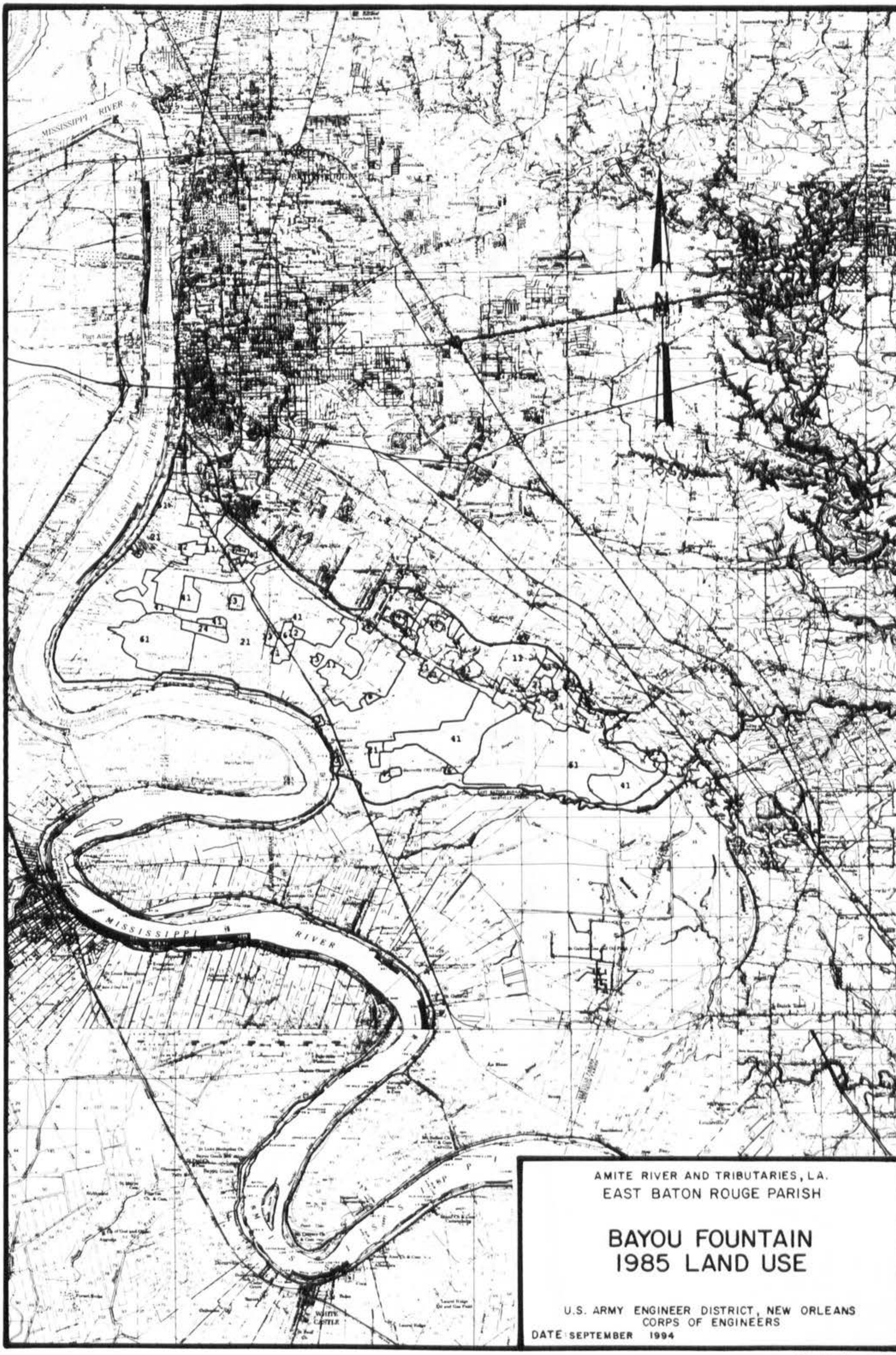

MISSISSIPPI RIVER
Port Allen
N
MISSISSIPPI RIVER
AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH
BAYOU FOUNTAIN
1978 LAND USE
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: SEPTEMBER 1994

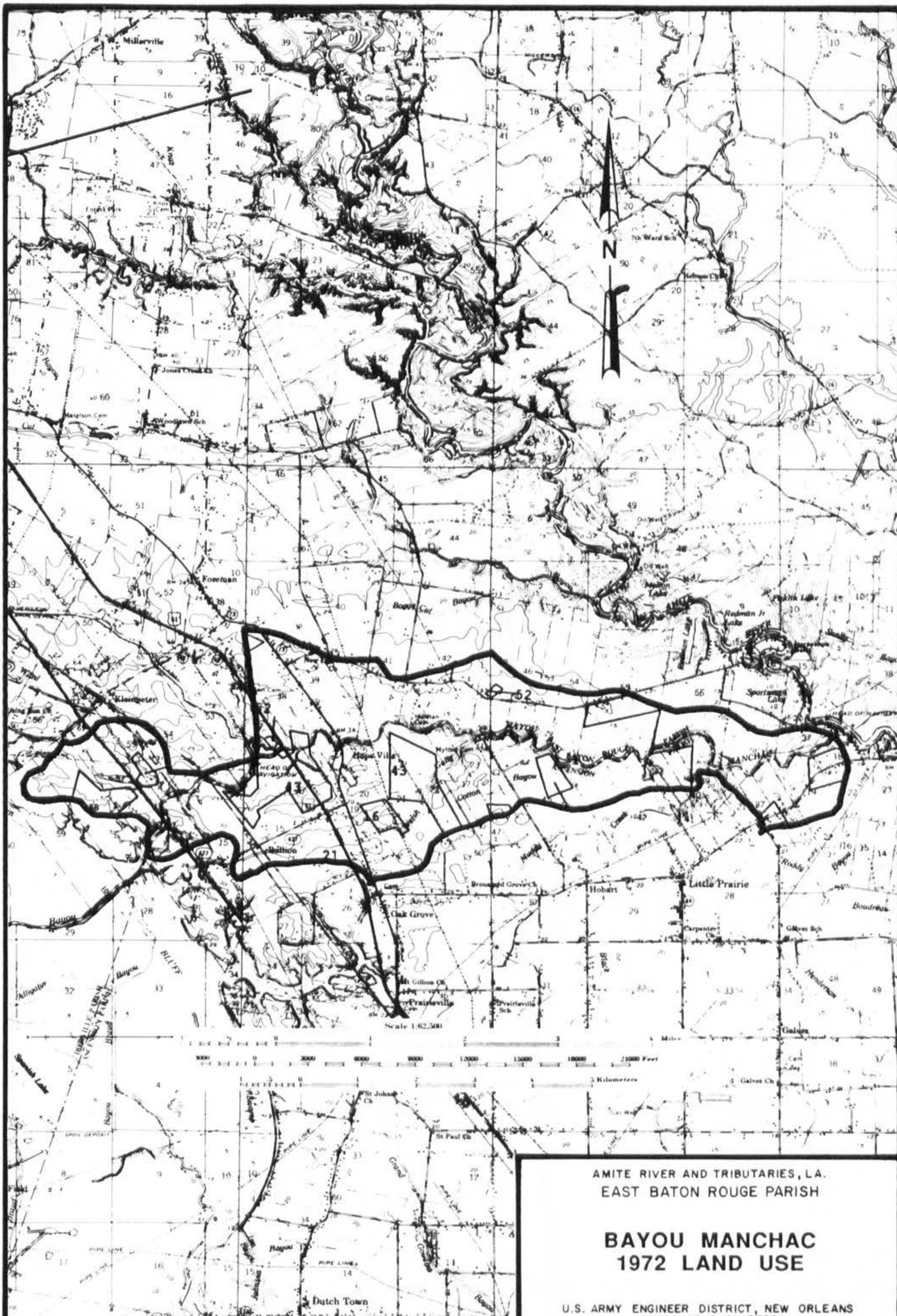
PLATE J-29

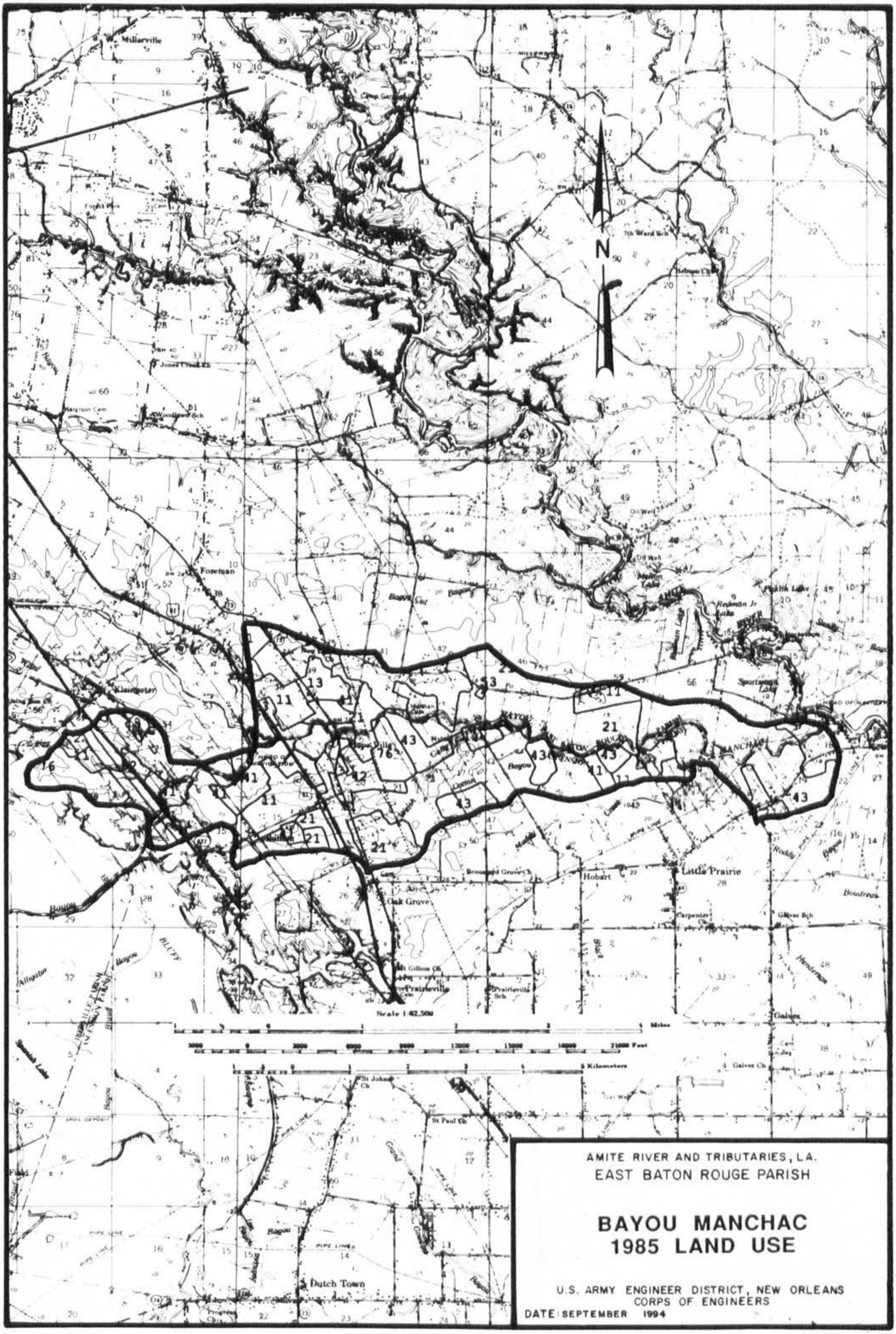


AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH

BAYOU FOUNTAIN 1985 LAND USE

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE SEPTEMBER 1994


AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH
BAYOU MANCHAC
1972 LAND USE
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: SEPTEMBER 1994
Scale 1:62,500
Miles
Feet
Kilometers
N


AMITE RIVER AND TRIBUTARIES, LA.
EAST BATON ROUGE PARISH
BAYOU MANCHAC
1985 LAND USE
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: SEPTEMBER 1994
Scale 1:62,500
Miles
Feet
Kilometers
N
Millerville
Foreman
Kleinpeter
Oak Grove
Little Prairie
Hobart
Prairieville
Dutch Town
Galvez
MANCHAC
Sportsman Lake

APPENDIX K

EAST BATON ROUGE PARISH
FLOOD DAMAGE PREVENTION ORDINANCE

EAST BATON ROUGE PARISH
FLOOD ORDINANCE

Since the mid 1950's East Baton Rouge Parish has experienced at least nine (9) major floods. Between 1974 and 1990 over 3000 flood claims totalling approximately 33.8 million dollars have been paid to the citizens of East Baton Rouge.

As a result of three floods in a nine (9) month period (June 1989, January and February 1990) the citizens of East Baton Rouge Parish were primed for a change and began to demand more stringent flood plain regulations.

The Department of Public Works under took a comprehensive study of the June 1989 flood. The results of this study identified several important factors including:

1.) Over 45% of the flood damaged structures were located in flood zones B and C. This indicates that many of these homes were under protected or carried no flood insurance. It also identifies many of the inaccuracies or short comings of the FEMA mapping process.

2.) Many of the flooded structures were constructed below the elevation of the adjacent street and or top of adjacent sanitary sewer manhole. These structures flooded due to roadside ditch overtopping or internal flooding from sewer backups.

From this study recommendations for floodplain regulations which exceed the FEMA minimum requirements were established and adopted by the Metropolitan Council in April of 1990. Some of the key elements of this ordinance include:

1.) Regulation of all Flood Zones including Zones B and C (Zone X) within the Parish.

2.) New subdivisions design and plating requirements.

Some of the more specific elements of the ordinance includes:

1.) That for any building permit issued in East Baton Rouge Parish a flood zone determination form must be processed by the Engineering Division of the Department of Public Works. This determination includes the flood zone at the site, the 100 year base flood elevation or adjacent base flood, and record inundation.

2.) A dual certificate of elevation prepared by a registered engineer or surveyor utilizing the information shown on the flood zone determination form. This "proposed and official" certificate of elevation establishes the minimum floor slab of the proposed structure and verifies the actual slab elevation once the foundation is constructed.

The certificate of elevation requires that the highest of four (4) elements establish the minimum lowest floor and include:

a.) Base Flood Elevation + Freeboard (1 or 2 foot)

b.) Record Inundation + Freeboard (1 or 2 foot)

c.) Centerline of the street + one foot.

d.) Top of sanitary sewer manhole + one foot.

3.) The ordinance established minimum street and parking lot elevation requirements:

a.) For minor streets and parking lots the minimum elevation is two (2) foot below the base flood or one (1) foot below record inundation.

b.) For major streets the minimum elevation is at or above the higher of the base floor or record inundation.

4.) The ordinance restricts unregulated sheet flow from paved parking areas into a street.

5.) The ordinance restricts fill placement or the actual loss of flood storage volume within the floodplain.

6.) The ordinance requires that all property located below the base flood elevation be indicated with a shaded drafting film on all subdivision and resubdivision plats. Basic flood data along with the subdivision benchmark and source bench marks must also be indicated.

Table of Contents

III REGULATORY BACKGROUND

3.01 Introduction

The City of Baton Rouge and the Parish of East Baton Rouge have the authority under the Plan of Government and under and by virtue of the general laws of the State of Louisiana to revise, compile and recodify their existing ordinances, which Code, when adopted, shall have the force and effect of an ordinance regularly enacted with the usual prerequisites of law.

The City of Baton Rouge and the Parish of East Baton Rouge, acting through the City Council and Parish Council (Metropolitan Council), authorized the revision, compilation and recodification of the existing ordinances of the City of Baton Rouge and the Parish of East Baton Rouge, into the **CODE OF ORDINANCES OF THE CITY OF BATON ROUGE AND THE PARISH OF EAST BATON ROUGE.**

This Code, containing Titles 1 to 15 inclusive, was adopted May 31, 1983 with an effective date of October 12, 1983.

3.02 Local Requirements

It is stated under Section 7.11, Drainage in Part II of the Subdivision Regulations in Title 7 - Planning and Zoning that adequate provisions shall be made for the disposal of stormwater subject to the approval of the Department of Public Works. Additionally, Section 7:11(1) Master Plan and manual of criteria states the developer shall plan all drainage for his subdivision or site or tract development in accordance with the master plan for drainage and in accordance with the manual of criteria for drainage provided by the Department of Public Works.

A copy of the Subdivision Regulations as adopted under City Ordinance 402 and Parish Ordinance 384 on April 27, 1955 as amended through June 13, 1990 may be obtained from the Planning Commission at:

209 St. Ferdinand Street
Baton Rouge, Louisiana 70802
Telephone: (504) 389-3144

Drainage related revisions to these subdivision regulations by the Metropolitan Council, by Ordinance, are shown as subsections 3.02.01, 3.02.02, 3.02.03, 3.02.04, 3.02.05 and 3.02.06.

SUBSECTION 3.02.01

ADOPTED
METROPOLITAN COUNCIL

FEB 23 1994

Brian Mayers

233

ORDINANCE 9836

AMENDING TITLE 7 (PLANNING AND ZONING), CHAPTER 1, PART II (SUBDIVISION REGULATIONS) OF THE CODE OF ORDINANCES OF THE CITY OF BATON ROUGE AND PARISH OF EAST BATON ROUGE, SO AS TO AMEND SECTION 7:11 THEREOF TO ADD SUBSECTION 7:11(10), RELATIVE TO DRAINAGE IMPACT STUDY.

BE IT ORDAINED by the Metropolitan Council of the Parish of East Baton Rouge and City of Baton Rouge that:

Section 1. Title 7, Chapter 1, Part II of the Code of Ordinances of the City of Baton Rouge and Parish of East Baton Rouge, is hereby amended so as to amend Section 7:11 thereof to add Subsection 7:11(10), which shall read as follows:

"(10) **DRAINAGE IMPACT STUDY:** Two (2) copies of the required drainage impact analysis of the proposed development and surrounding affected areas must be submitted to the Department of Public Works. The subdivision Preliminary Plat or site plan will not be approved until the drainage impact analysis has been reviewed by the Department of Public Works.

Exemptions: The following development activities shall be exempted from the requirements of preparing a drainage impact study:

1) Development in which the area of impervious surface does not exceed 20% of the development area at the point of discharge from the site. The total impervious area shall include all buildings, driveways, sidewalks, streets, parking lots, lakes, ponds, etc. All undeveloped open space, common areas etc., must be clearly identified.

2) Additions or modifications to existing developments which results in no more than a 10% increase in existing impervious area and which have existing public storm drainage facilities designed to accommodate runoff from the existing site.

Waivers: Developers may request that the Planning Commission approve a waiver of the drainage impact analysis. If such a request is granted, the Planning Commission Director will provide written approval. A copy of the waiver authorization shall be forwarded to the Director of Public Works and no detailed drainage impact analysis shall be required for the development. A waiver must be requested in writing and contain sufficient information regarding the specific details of the proposed development. A waiver shall be considered for approval provided:

1) The proposed development results in no more than a 10% increase in the 10 year pre-development peak discharge at the point of discharge from the development site.

and

2) The site is located within existing developed areas which are served by a network of public storm drainage facilities which were designed to accommodate runoff from the development site.

Not withstanding the above, a waiver may be granted provided sufficient information can be submitted indicating that the runoff from the proposed development is consistent with, and discharges to, a previously approved development or is a part of an approved larger plan of development, both having adequate drainage facilities.

The Drainage Impact Study shall comply with the following minimum requirements:

A) **Site Location and Description:**

1) Location:

Describe location of subject property; locate by Township and Range; identify adjacent developments, major drainage outfalls, streets, highways, lot and block page number; and provide a vicinity map.

2) Description:

Describe the predominate existing land use and future land use in project watershed (Horizon Plan Land Use Data, aerial photo's, etc.). Describe the proposed development, soil types, vegetative cover, watershed slopes and provide an estimate of percent of impervious area for pre and post development conditions. Provide photos of existing channels, ditches, natural drains and drainage structures.

B) **Watershed Map:**

Delineate drainage boundaries; indicate the acreage; and show slope of basins, and peak 10 year runoff rate at entry and exit points of the development. The watershed map should indicate the location of existing channels, ditches, natural drains, proposed major drainage structures, channel realignments and cross sections locations.

The latest U.S.G.S. 7.5 minute quadrangle map or better, at a scale of 1 inch = 500 feet or less, may be used as the base for the watershed map.

C) **Hydrologic Design:**

1) The drainage impact analysis shall indicate existing condition peak 10 year flow rates at the development entry and exit points.

2) The drainage impact analysis shall indicate future condition peak 10 year flow rates at the development entry and exit points.

D) **Hydraulic Capacities:**

1) On site capacity:

Indicate capacity of any existing drainage outfall facility (ditch, canal, culvert, bridge, etc.) within the proposed development site and required type size, and capacity of any proposed outfall facilities as defined above.

2) Off-site capacity:

Determine capacity of existing downstream outfall facilities (ditches, canals, culverts, bridges, etc.) that will be utilized to convey flow from the downstream limits of the proposed development to the first public outfall as identified on the East Baton Rouge Parish Stream Index Map. An inventory of downstream structures including size, type, invert elevation, and over topping elevation should be made. Channel cross sections at upstream and downstream limits of the proposed development, at structure locations and at intermediate canal locations shall be required to adequately define existing channel capacities.

Where the proposed development is located an extended distance from an indexed stream the analysis may be terminated at a point where the total area drained exceeds the project area by five (5) times for single family (A-1) residential developments and ten (10) times for high density residential and commercial developments.

E) **Special Site Conditions:**

Special conditions which may exist at the proposed development site should be clearly identified including but not limited to such items as:

1) Special Flood Hazard Areas (Firm Zones A and AE)
2) Regulatory Floodway
3) Fill placement location and mitigation requirements
4) Potential Wetland Sites
5) Churches
6) Schools
7) Cemeteries
8) Landfills and Hazardous Waste Sites
9) Parks

F) <u>Study Conclusions and Recommendations:</u>

Study should clearly identify the results and conclusions of the analysis and provide recommendations of any required action(s) so that no adverse impact is experienced by surrounding properties."

Section 2. The effective date of this ordinance shall be sixty (60) calendar days after the adoption of this ordinance by the Metropolitan Council. All preliminary plats and site plans submitted to the Planning Commission for approval after the effective date shall comply with all provisions of this ordinance.

Section 3. All ordinances or parts of ordinances in conflict herewith are hereby repealed.

SUBSECTION 3.02.02

JAN
[redacted] 19 1994
Brian Mayers

183 ORDINANCE 9808

AMENDING TITLE 7 (PLANNING AND ZONING), CHAPTER 3 OF THE CODE OF ORDINANCES OF THE CITY OF BATON ROUGE AND THE PARISH OF EAST BATON ROUGE, SO AS TO ADD PART XIII THEREOF RELATIVE TO ESTABLISHING MINIMUM LANDSCAPE REQUIREMENTS, AND SHALL BE KNOWN AS THE "LANDSCAPE ORDINANCE."

BE IT ORDAINED by the Metropolitan Council of the Parish of East Baton Rouge and City of Baton Rouge that:

Section 1. Title 7, Chapter 3 of the Code of Ordinances of the City of Baton Rouge and Parish of East Baton Rouge, is hereby amended so as to add Part XIII thereof, which shall read as follows:

"PART XIII. MINIMUM LANDSCAPE REQUIREMENTS.

Section 13.1. Purpose.

The purpose of this Part is to protect and enhance the community's environmental, economic and aesthetic resources consistent with the goals of the City-Parish Comprehensive Land Use And Development Plan (Horizon Plan) thereby promoting the public health, safety and general welfare of the citizens and contributing to the quality of life by encouraging a high level of design in the development of the City and Parish.

Section 13.2. Applicability of Landscape Ordinance.

1. The provisions of this Part shall apply to:

(a) All new commercial, industrial, multi-family, religious, educational, institutional and public & semi-public land uses that are developed after the effective date of this Ordinance, or

(b) Development that requires the issuance of a building permit for a building addition amounting to more than fifty (50%) percent of existing street facade.

2. New development on lots with less than twenty-five thousand square feet within a multi-family, commercial or industrial- type subdivision that was approved prior to the adoption of this ordinance shall be exempted from this Ordinance.

Section 13.3. Definitions.

The following definitions shall apply to this Ordinance:

(a) **Landscape Area** - A non-built upon area of land in which landscape materials are placed, planted or maintained.

(b) **Landscape Plan** shall mean the preparation of graphic and written criteria, specifications, and detailed plans to arrange and modify the effects of natural features such as plantings, ground and water forms, circulation, walks and other features to comply with the provisions of this Ordinance.

(c) **Tree - Class "A"** - any self-supporting woody plant of a species which normally grows to an overall height of at least fifty feet, usually with one main stem or trunk and many branches, as in several varieties of oak trees.

(d) **Tree - Class "B"** - any self-supporting woody plant of a species which normally grows to an overall height of at least twenty-five feet, with either one main stem or trunk with many branches, or several stems or trunk (Crape Myrtles for example).

(e) **Shrub** - A woody perennial plant differing from a perennial herb by its persistent and woody stems, and from a tree by its low stature (generally obtaining a height less than eight feet) and its habit of branching from the base.

(f) **Ground Cover** - Material planted in such a way as to form a continuous cover over the ground that can be maintained at a height not more than twelve inches.

(g) **Accessways** - A paved area intended to provide ingress or egress of vehicular traffic from a public right-of-way to an off-street parking area or loading area. Parking area aisles are not to be constructed as accessways.

(h) **Buffer Planting Area** - Area of land which is unpaved located between the side or rear property line abutting property zoned A-1, A-2, A-3 Residential and any building or vehicular use area designated for the preservation and placement of plant materials.

(i) **Landscape Materials** - Material such as, but not limited to, living trees, shrubs, vines, lawn grass, ground cover, earthen mounds, landscape water features and non-living, durable materials commonly used in landscaping including, but not limited to rocks, pebbles, sands, decorative walls, fences, brick, stone or concrete paving or landscape support systems such as irrigation, drainage and landscape lighting components.

(j) **Planting Area** - Any area designed for landscape material installation having a minimum area of twenty-five square feet.

(k) **Street Planting Area** - Front yard and the contiguous unpaved area of land which is to be used for landscape planting.

(l) **Vehicular Use Area** - That area of private development subject to vehicular traffic, including

accessways, parking aisles, loading and service areas, areas used for parking and storage of vehicles, boats, or portable construction equipment and all land which vehicles cross over as a function of primary use.

(m) **Trash and Garbage Storage Area** - That area of a development used for the storage and containment of refuse and refuse containers (i.e. "dumpsters").

Section 13.4. Landscape Standards.

(1) The following areas shall be developed and maintained according to the landscape standards:

a. Street planting areas,
b. Sight triangle areas at street intersections,
c. Buffer planting areas, along side and rear property lines,
d. Vehicular use areas within parking lots and auto storage areas,
e. Trash & garbage storage areas (located less than one-hundred (100') feet from a public street).

(2) The following Standards shall be included in the Landscape.

a. All landscaping shall be installed in a sound manner and in accordance with accepted standards of the Louisiana Nurseryman's Manual for the Environmental Horticulture Industry.

b. Plant material shall be true to name, variety and size and shall conform to all applicable provisions of the American Standards for Nursery Stock, latest edition.

c. All single trunk trees shall have one-and-one-half inch to two inch caliper immediately after planting. Two multi-trunk trees three-quarters inch to one inch in caliper may be substituted for each single trunk tree.

d. Multi-trunk trees shall have main stems three-quarters inch to one inch in caliper immediately after planting. All multi-trunk trees shall have a minimum of three trunks.

e. Ground covers shall be minimum of four inch container stock spaced twelve inches on center. Two-and-one-half inch container stock may be substituted and spaced eight inches on center.

f. A minimum of twenty-five square feet of non-paved area is required for each tree where it is planted. Approved porous paving will be allowed. No tree or shrub shall be planted in any servitude or easement without the written permission of the user agency.

(3) Technical requirements for the installation of plant materials and landscape area site development shall be as follows:

a. There shall be one Class "A" tree or two Class "B" trees for each ten-thousand square feet, or fraction thereof, of developed site area. Trees required in the street planting area shall be counted towards the overall site tree requirements.

b. The street planting area shall contain a minimum of one Class "A" tree or two Class "B" trees for every sixty linear feet of site frontage, or fraction thereof. The required number of trees may be located anywhere within the street planting area.

c. Any multi-family, commercial, religious, educational, institutional or public & semi-public development which abuts a single family use shall provide a fifteen foot wide landscape area along such abutment; said landscape area to be planted with the minimum of one Class "A" tree for every sixty linear feet, or fraction thereof.

d. Any industrial development which abuts any residential use shall provide a fifteen foot wide landscape area along such abutment, said landscape area to be planted with a minimum of one Class "A" tree for every sixty linear feet, or fraction thereof.

e. Vehicular use areas shall be required to have a minimum of five percent of the total vehicular use area landscaped. Such landscaping shall be distributed within the vehicular use area. The landscaping shall be installed accordingly:

(1) For vehicular use areas of one to fifty parking spaces, one Class "A" tree or one Class "B" tree for every twenty-five parking spaces, or fraction thereof.

(2) For vehicular use areas of fifty to one hundred parking spaces, one Class "A" tree or one Class "B" tree for every eighteen parking spaces, or fraction thereof.

(3) For vehicular use areas of over one hundred parking spaces, one Class "A" tree or one Class "B" tree for every twelve parking spaces, or fraction thereof.

(4) All such landscaped areas shall be protected from vehicular access to these areas.

f. For new vehicular use areas on sites zoned C-5, permanent landscaping shall be installed as follows:

(1) Trees shall be planted at the rate of one Class "A" tree or one Class "B" tree per twelve parking spaces, or fraction thereof.

(2) Required trees may be planted within the vehicular use area or along its perimeter. Where such a planting of trees may not be entirely accommodated within the property

lines of the site, some or all of said trees may be planted within the public right-of-way in accordance with the Downtown Development District Street Tree Plan as reviewed by the Downtown Development District Commission.

(3) Residual areas not used for vehicular use or access shall be landscaped.

g. Technical requirements for the maintenance of plant materials and landscape areas shall be as follows:

(1) The owner, or his agent, shall be responsible for the maintenance, repair and replacement of all landscape materials as may be required by the provisions of this Ordinance.

(2) Landscape maintenance specifications require that all landscaping shall be maintained in a sound manner and in accordance with accepted maintenance procedures as established by the Louisiana Association of Nurserymen.

(3) All plant materials and planted areas shall be tended and maintained in a healthy growing condition; replaced when necessary and kept free of refuse and debris.

h. Existing trees may be credited towards the landscape materials required by this part.

(1) In all applicable zoning districts, credit may be applied toward the tree planting requirements of this ordinance by the preservation of existing trees within Street Planting Areas, Buffer Areas and other areas of the site left undisturbed by construction.

(2) The owner is encouraged to preserve as many existing trees and shrubs as possible in the design and implementation of the landscape plan.

(3) Trees preserved in the street planting areas shall be credited toward street planting requirements, trees preserved in vehicular use areas be credited toward vehicular use area requirements and trees preserved in a buffer planting area shall be credited toward buffer area planting requirements.

(4) It shall be the responsibility of the owner to use reasonable care to maintain preserved trees. If a preserved tree dies within five years, it is the responsibility of the owner to replace that tree with the number of trees credited on a Class matching basis within six months. The owner shall be responsible for maintaining all plant

materials required by this Ordinance in good living condition.

(5) Tree credit rate for each tree preserved shall be determined by the following schedule:

Existing Dripline Diameter of preserved tree(s)*	(or)	Existing Trunk Diameter of preserved Tree(s)**	Number of Tree Credits
50 feet or greater in spread		26 inches or greater in dia.	5
40-49 " " " "		20 " " " " "	4
20-39 " " " "		9-19 " " " " "	3
6-19 " " " "		3-8 " " " " "	2

*Dripline Diameter measurement shall be rounded off to the nearest foot.

**Diameter of trunk of preserved tree shall be rounded off to the nearest inch, measured at a height four and one half (4 1/2) feet above natural grade.

(a) All other trees preserved will receive one credit with the exception of Chinese Tallow (Sapium sebiferum), Black Willow (Salix nigra), Cottonwood (Populus deltoides), Camphor Tree (Cinnamomum Camphora) and other trees with life spans of twenty years or less.

(b) If any preserved tree dies within five years of construction on the preservation site, one tree shall be replaced for each tree credited against such preserved tree that dies.

(6) In order to receive credit for preserved trees, the owner must include as part of the Landscape Plan submittal a Tree Preservation Plan which must be approved by the Director of Landscape and Forestry.

(a) The Tree Preservation Plan shall include the location, size and condition of each tree to be preserved, along with an indication of proposed development features which may impact such trees, and any other pertinent information as required by the Director of Landscape and Forestry to evaluate existing and proposed conditions.

(b) The Tree Preservation Plan shall include a detailed description of all methods to be used to ensure the survival of all trees scheduled for preservation credit, including information that may be required by the Director of Landscape and Forestry to interpret the intent and methodology proposed.

(c) All tree preservation methodology shall conform to the standards of the Louisiana Department of Agriculture and Forestry, the Louisiana Horticulture Commission, and the International Society of Arboriculture.

Section 13.5. Landscape Plan Requirements.

1. All building permit applications covered by this Ordinance shall be accompanied by a landscape plan. This landscape plan shall be drawn in accordance with Louisiana Horticulture Law and shall include such criteria that may be required by the Director of Landscape and Forestry or City-Parish Building Official to interpret the extent of the permit application.

2. Standards, as specified in Section 13.4 (Landscape Standards), shall apply to the design, installation and maintenance of all landscaping required.

Section 13.6. Alternative Compliance.

1. The Landscape Standards contained in Section 13.4 are intended to encourage development which is economically viable and environmentally sensitive. The standards are not intended to be so specific to inhibit creative development. Project conditions associated with individual sites may justify approval of alternative methods of compliance with the Landscape Standards. Conditions may arise where normal compliance is impractical or impossible, or where maximum achievement of the City-Parish's objectives can only be obtained through alternative compliance. Such conditions are contained within the Landscape Standards.

2. Requests for alternative compliance will be accepted for any permit application to which the requirements of this Ordinance apply, when one or more of the following conditions are met:

(a) Topography, soil, vegetation, drainage or other site conditions are such that full compliance is impractical.

(b) Improved environmental quality would result from the alternative compliance provisions of this ordinance.

(c) Spatial limitations, unusually shaped pieces of land, unusual servitude requirements or prevailing practices in the surrounding neighborhood may justify alternative compliance for in-fill sites.

(d) Change on an existing site where requirements of this Ordinance are not spatially possible.

(e) Public safety considerations make alternative compliance necessary.

(f) Existing lots in approved multi-family, commercial and industrial subdivisions which exist on the effective date of this Ordinance.

3. A request for alternative compliance shall be submitted to the Director of Landscape and Forestry at the time the Landscape Plan is submitted. The decision

of the Director of Landscape and Forestry will be final, unless the applicant appeals per Section 13.8.

4. Requests for alternative compliance shall be accompanied by sufficient written explanation and Landscape Plan drawings to allow appropriate evaluation and decision by the Director of Landscape And Forestry.

5. In a situation where compliance with this Ordinance is not possible, and there is no feasible alternative for compliance the applicant shall apply to the Planning Commission and the Metropolitan Council for a waiver of this Section of the Zoning Ordinance.

Section 13.7. Permits and Inspection Requirements.

1. Prior to any clearing of tracts of five acres or more the property owner shall obtain from the City-Parish Inspection Division a Clearing Permit approved by the Flood Plain Administrator of the Department of Public Works, who shall also notify the Director of Landscape and Forestry.

2. A Landscape Plan shall be submitted along with the building plans when applying for a building permit. The Landscape Plan shall be approved by the Director of Landscape and Forestry (who must be a Landscape Architect registered in the State of Louisiana) prior to issuance of the building permit.

3. If the owner or developer has not installed the approved landscaping within ninety days of the completion of the building, the Director of Landscape and Forestry may place the owner in default which shall constitute a violation of this section of the Zoning Ordinance. Such violation shall subject the owner to a fine of fifty ($50.00) dollars per day for each day that the required landscaping is not completed.

4. Failure to maintain plant materials and planting areas as determined through periodic inspection by the Director of Landscape and Forestry shall constitute a violation of this Section of the Zoning Ordinance. Such violation shall subject the owner to a fine of fifty ($50.00) dollars per day for each day that the required landscaping is not maintained.

Section 13.8. Enforcement, Appeals and Penalties.

1. The Director of Landscape and Forestry shall enforce the requirements set forth in this Part and also shall be responsible for performing necessary inspections to determine if the required landscaping has been installed according to the approved Landscape Plan.

2. Any applicant whose Landscape Plan is rejected may appeal to the Landscape Review Committee within thirty days of notice of rejection. The appeal must be in writing and fully state the reason or reasons for the appeal. The appeal must also be accompanied by a copy of the Landscape Plan submitted to the Building Official.

3. The Landscape Review Committee shall be composed

of eleven members appointed by the Mayor/President, who shall appoint one member from each of the following:

a. The American Society of Landscape Architects
b. Baton Rouge Landscape Association
c. American Institute of Architects, Baton Rouge Chapter
d. Associated General Contractors of Baton Rouge
e. Baton Rouge Board of Realtors, Commercial and Industrial Division
f. Baton Rouge Green
g. Baton Rouge Chamber of Commerce
h. Baton Rouge Tree Commission
i. Baton Rouge Land Developers Council
j. Associated Builders and Contractors
k. Baton Rouge Apartment Association

Initial terms of members a, d, g and j shall be three years; of members b, e, h and k shall be two years, and members c, f and i shall be one year. All subsequent appointments shall be for three year terms. Vacancies shall be filled by appointment to fulfill regular term. Members may be appointed to no more than two consecutive terms.

4. The Landscape Review Committee is hereby directed and authorized as a committee with full powers to act and review all appeals from the denial of a certificate or the rejection of a Landscape Plan. Any six members of said Committee shall constitute a quorum.

5. Upon the filing of an appeal, the Landscape Review Committee shall conduct a hearing on the appeal within thirty days of notice of filing. The Committee shall notify the applicant and the Director of Landscape and Forestry of the scheduled date of the hearing. The Committee shall establish rules and regulations for its own procedure at the hearings.

6. A decision of the Landscape Review Committee to modify or reverse a decision of the Director of Landscape and Forestry shall be in writing and shall set forth the reasons therefor. The decision shall also specify the conditions upon which the modification is made.

7. A decision of the Landscape Review Committee may be appealed to the Planning Commission and the Metropolitan Council.

Section 13.9. Administrative Guidelines.

1. The Director of Landscape and Forestry shall prepare administrative guidelines to this Ordinance consisting of rules, regulations, procedures, and landscape drawing requirements for the administration and enforcement of this Ordinance. These guidelines shall be approved by the Landscape Review Committee.

2. Changes or modifications to the Landscape Standards shall be approved by majority vote of the Landscape Review Committee, the Planning Commission and the Metropolitan Council following a public hearing.

3. The City-Parish of East Baton Rouge through the Inspection Division of the Department of Public Works shall be authorized to collect a fifty ($50.00) dollar application fee to cover processing charges which shall be included in the total building permit fees as required for the implementation of this Ordinance.

Section 13.10. Conflicts.

If provisions of this Ordinance conflict with other ordinances or regulations, the more stringent limitation or requirements shall govern or prevail to the extent of the conflict.

Section 13.12. Severability.

If any section, subsection, sentence clause, provision or part of this Ordinance shall be held invalid for any reason, the remainder of this Ordinance shall not be affected thereby, but shall remain in full force and effect.

Section 13.13. Effective Date.

This Ordinance shall take effect January 19, 1994."

Section 2. All ordinances or parts of ordinances in conflict herewith are hereby repealed.

SUBSECTION 3.02.03

ADOPTED
METROPOLITAN COUNCIL

APR 2 8 1993

Donald Mizorka
COUNCIL ADMINISTRATOR

244

ORDINANCE 9613

AMENDING TITLE 8, CHAPTER 8 (FLOOD DAMAGE PREVENTION) OF THE CODE OF ORDINANCES OF THE CITY OF BATON ROUGE AND PARISH OF EAST BATON ROUGE, SO AS TO INCORPORATE THE NEW FEMA FLOOD PLAIN MANAGEMENT REGULATIONS.

BE IT ORDAINED by the Metropolitan Council of the Parish of East Baton Rouge and City of Baton Rouge that:

Section 1. Title 8, Chapter 8 of the Code of Ordinances of the City of Baton Rouge and Parish of East Baton Rouge, is hereby amended and re-enacted to read as follows:

"CHAPTER 8. FLOOD DAMAGE PREVENTION.

PART I. STATUTORY AUTHORIZATION, FINDINGS OF FACT, PURPOSE AND METHODS

Sec. 8:800. Statutory authorization.

The Legislature of the State of Louisiana has in Louisiana Revised Statutes 38:84 et seq. delegated the responsibility to local governmental units to adopt regulations designed to minimize flood losses. Therefore, the Metropolitan Council does ordain as provided in this chapter.

Sec. 8:801. Findings of fact.

(1) The flood hazard areas of the city-parish are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, and extraordinary public expenditures for flood protection and relief, all of which adversely affect the public health, safety and general welfare.

(2) These flood losses are created by the cumulative effect of obstructions in floodplains which cause an increase in flood heights and velocities, and by the occupancy of flood hazard areas by uses vulnerable to floods and hazardous to other lands because they are inadequately elevated, flood-proofed or otherwise protected from flood damage.

Sec. 8:802. Statement of purpose.

It is the purpose of this chapter to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

(1) Protect human life and health;

(2) Minimize expenditure of public money for costly flood control projects;

(3) Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;

(4) Minimize prolonged business interruptions;

(5) Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in floodplains;

(6) Help maintain a stable tax base by providing for the sound use and development of floodprone areas in such a manner as to minimize future flood blight areas; and

(7) Insure that potential buyers are notified that property is in a flood area.

Sec. 8:803. Methods of reducing flood losses.

In order to accomplish its purposes, this chapter uses the following methods:

(1) Restrict or prohibit uses that are dangerous to health, safety or property in times of flood, or cause excessive increases in flood heights or velocities;

(2) Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;

(3) Control the alteration of natural floodplains, stream channels, and natural protective barriers, which are involved in the accommodation of floodwaters;

(4) Control filling, grading, dredging and other development which may increase flood damage;

(5) Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards to other lands.

PART II. DEFINITIONS

Sec. 8:821. Specific definitions.

Unless specifically defined below, words or phrases used in this chapter shall be interpreted to give them the meaning they have in common usage and to give this chapter its most reasonable application.

Appeal means a request for a review of the floodplain administrator's interpretation of any provision of this chapter or a request for a variance.

Area of shallow flooding means a designated AO, AH, or VO Zone on a community's flood insurance rate map (FIRM) with a one (1) percent chance or greater annual chance of flooding to an average depth of one (1) to three (3) feet where a clearly defined channel does not exist, where the path of flooding is unpredictable, and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.

Area of special flood hazard is the land in the floodplain within a community subject to a one (1) percent or greater chance of flooding in any given year. The area may be designated as Zone A on the flood hazard boundary map (FBBM). After detailed ratemaking has been completed in preparation for publication of the FIRM, Zone A usually is refined into Zones A, AE, AE, AO, A1-99, VO, V1-30, VE or V.

Base flood means the flood having a one (1) percent chance of being equaled or exceeded in any given year.

Basement means any area of the building having its floor subgrade (below ground level) on all sides.

Critical feature means an integral and readily identifiable part of a flood protection system, without which the flood protection provided by the entire system would be compromised.

Development means any man-made change in improved and unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation, drilling operations or storage of equipment or materials.

Elevated building means a nonbasement building (i) built in the case of a building in Zones A1-30, AE, A, A99, AO, AE, B, C, X, and D, to have the top of the elevated floor, or in the case of a building in Zones V1-30, VE, or V, to have the bottom of the lowest horizontal structure member of the elevated floor elevated above the ground level by means of pilings, columns (posts and piers), or shear walls parallel to the flow of the water and (ii) adequately anchored so as not to impair the structural integrity of the building during a flood of up to the magnitude of the base flood. In the case of Zones A1-30, AE, A, A99, AO, AE, B, C, X, D, "elevated building" also includes a building elevated by means of fill or solid foundation perimeter walls with openings sufficient to facilitate the unimpeded movement of floodwaters. In the case of Zones V1-30, VE, or V, "elevated building" also includes a building otherwise meeting the definition of "elevated building," even though the lower area is enclosed by means of breakaway walls if the breakaway walls meet the standards of section 60.3(e)(5) of the National Flood Insurance Program regulations.

Existing construction means, for the purposes of determining rates, structures for which the "start of construction" commenced before the effective date of the FIRM or before January 1, 1975, for FIRM's effective before that date. "Existing construction" may also be referred to as "existing structures."

Existing manufactured home park or subdivision means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including, at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed before the effective date of the floodplain management regulations adopted by a community.

Expansion to an existing manufactured home park or subdivision means the preparation of additional sites by the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including the installation of utilities, the construction of streets, and either final sites grading or the pouring of concrete pads).

Flood or flooding means a general and temporary condition of partial or complete inundation of normally dry land areas from

(1) the overflow of inland or tidal waters, or

(2) The unusual and rapid accumulation or runoff of surface waters from any source.

Flood insurance rate map (FIRM) means an official map of a community, on which the Federal Emergency Management Agency has delineated both the areas of special flood hazard and the risk premium zones applicable to the community.

Flood insurance study is the official report provided by the Federal Emergency Management Agency. The report contains flood profiles and water surface elevation of the base flood, as well as the flood boundary-floodway map.

Flood proofing means any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.

Flood protection system means those physical structural works for which funds have been authorized, appropriated and expended, and which have been constructed specifically to modify flooding in order to reduce the extent of the areas within a community subject to a "special flood hazard" and the extent of the depths of associated flooding. Such as system typically includes hurricane tidal barriers, dams, reservoirs, levees or dikes. These specialized flood modifying works are those constructed in conformance with sound engineering standards.

Floodplain or flood-prone area means any land area susceptible to being inundated by water from any source (see definition of "Flooding").

Floodplain management means the operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to

emergency preparedness plans, flood control works and floodplain management regulations.

Floodplain management regulations means zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as a floodplain ordinance, grading ordinance and erosion control ordinance) and other applications of police power. The term describes such state or local regulations, in any combination thereof, which provide standards for the purpose of flood damage prevention and reduction.

Floodway (regulatory floodway) means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

Functionally dependent use means a use which cannot perform its intended purpose unless it is located or carried out in close proximity to water. The term includes only docking facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and ship building and ship repair facilities, but does not include long-term storage or related manufacturing facilities.

Habitable floor means any floor usable for the following purposes, which includes working, sleeping, eating, cooking or recreation, or a combination thereof. A floor used for storage purposes only is not a "habitable floor."

Highest adjacent grade means the highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

Historic structure means any structure that is:

(a) Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior as meeting the requirements for individual listing on the National Register:

(b) Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;

(c) Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of Interior; or

(d) Individually listed on a local inventory or historic place in communities with historic preservation programs that have been certified either:

(1) By an approved state program as determined by the Secretary of the Interior; or

(2) Directly by the Secretary of the Interior in states without approved programs.

Levee means a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control or divert the flow of water so as to provide protection from temporary flooding.

Levee system means a flood protection system which consists of a levee, or levees, and associated structures, such as closure and drainage devices, which are constructed and operated in accordance with sound engineering practices.

Lowest floor means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood-resistant enclosure, usable solely for parking or vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirement of section 60.3 of the National Flood Insurance Program regulations.

Manufactured home means a structure transportable in one (1) or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For floodplain management purposes, the term "manufactured home" also includes park trailers, travel trailers and other similar vehicles placed on a site for greater than one hundred eighty (180) consecutive days. For insurance purposes, the term "manufactured home" does not include park trailers, travel trailers and other similar vehicles.

Manufactured home subdivision means a subdivision as defined by Section 7:4 which is primarily used by manufactured homes or which is designated as such.

Mean sea level means, for purposes of the National Flood Insurance Program, the National Geodetic Vertical Datum (NGVD) of 1929 or other datum, to which base flood elevations shown on a community's flood insurance rate map are referenced.

Mobile home park means a plot of ground upon which two (2) or more occupied mobile homes/manufactured homes or a combination of mobile homes/manufactured homes and campers are located on a rental or lease basis.

New construction means, for floodplain management purposes, structures for which the "start of construction" commenced on or after the effective date of a floodplain management regulation adopted by a community and includes any subsequent improvements to such structures.

New Manufactured Home Park or Subdivision means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date of floodplain management regulations adopted by a community.

Record inundation means the highest flood level recorded by the city-parish in an applicable area.

Recreational vehicle means a vehicle which is (i) built on a single chassis; (ii) 400 square feet or less when measured at the largest horizontal projections; (iii) designed to be self-propelled or permanently towable by a light duty truck; and (iv) designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

Start of construction (for other than new construction or substantial improvements under the Coastal Barrier Resources Act (Pub. L. 97-348)), includes substantial improvement and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, placement or other improvement was within one hundred eighty (180) days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for basement, footings, piers or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

Structure means a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured home.

Substantial damage means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed forty (40) percent of the market value of the structure before the damage occurred.

Substantial improvement means any repair, reconstruction or improvement of a structure, the cost of which equals or exceeds forty (40) percent of the market value of the structure either before the improvement or repair is started or, if the structure has been damaged

and is being restored, before the damage occurred. For the purpose of this definition, "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure. The term does not, however, include either any project for improvement of a structure to comply with existing state or local health, sanitary or safety code specifications which are solely necessary to assure safe living conditions, or any alteration of a structure listed on the National Register of Historic Places or a state inventory of historic places.

Variance is a grant of relief to a person from the requirements of this chapter when specific enforcement would result in unnecessary hardship. A variance, therefore, permits construction or development in a manner otherwise prohibited by this chapter. (For full requirements see section 60.6 of the National Flood Insurance Program regulations.)

Violation means the failure of a structure or other development to be fully compliant with the community's floodplain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in section 60.3(b)(5), (c)(4), (c)(10), (d)(3), (e)(2), (e)(4), or (e)(5) of the National Flood Insurance Program regulations is presumed to be in violation until such time as that documentation is provided.

Water surface elevation means the height, in relation to the National Geodetic Vertical Datum (NGVD) of 1929 (or other datum, where specified), of floods of various magnitudes and frequencies in the floodplains of coastal or riverine areas.

PART III. GENERAL PROVISIONS

Sec. 8:831. Lands to which this chapter applies.

This chapter shall apply to all areas of special flood hazard and in flood Zones B, C and X within the jurisdiction of the City-Parish.

Sec. 8:832. Basis for establishing the areas of special flood hazard.

The areas of special flood hazard identified by the Federal Emergency Management Agency in a scientific and engineering report entitled, "The Flood Insurance Study for East Baton Rouge Parish, Baton Rouge and Vicinity," dated May 17, 1993, with accompanying flood insurance rate maps and flood boundary-floodway maps (FIRM and FBFM) and any revisions thereto are hereby adopted by reference and declared to be a part of this chapter.

Sec. 8:833. Establishment of development permit.

A development permit shall be required to ensure conformance with the provisions of this chapter.

Sec. 8:834. Compliance.

No structure or land shall hereafter be located, altered or have its use changed without full compliance with the terms of this chapter and other applicable regulations.

Sec. 8:835. Abrogation and greater restrictions.

This chapter is not intended to repeal, derogate or impair any existing easements, covenants or deed restrictions. However, where this chapter and another ordinance conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

Sec. 8:836. Interpretation.

In the interpretation and application of this chapter, all provisions shall be considered as minimum requirements, liberally construed in favor of the governing body, and deemed neither to limit nor repeal any other powers granted under state statutes.

Sec. 8:837. Warning and disclaimer of liability.

The degree of flood protection required by this chapter is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. On rare occasions greater floods can and will occur, and flood heights may be increased by man-made or natural causes. This chapter does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flood damages. This chapter shall not create liability on the part of the community or any official or employee thereof for any flood damages that result from reliance on this chapter or any administrative decision lawfully made thereunder.

PART IV. ADMINISTRATION

Sec. 8:841. Designation of the floodplain administrator.

The Director of Public Works is hereby appointed the floodplain administrator to administer and implement the provisions of this chapter and other appropriate sections of 44 CFR (National Flood Insurance Program Regulations) pertaining to floodplain management.

Sec. 8:842. Duties and responsibilities of the floodplain administrator.

Duties and responsibilities of the floodplain administrator shall include, but not be limited to, the following:

(1) Maintain and hold open for public inspection all records pertaining to the provisions of this chapter.

(2) Review permit application to determine whether proposed building site, including the

placement of manufactured homes, will be reasonably safe from flooding.

(3) Review, approve or deny all applications for development permits required by adoption of this chapter.

(4) Review permits for proposed development to assure that all necessary permits have been obtained from those federal, state or local governmental agencies (including section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334) from which prior approval is required.

(5) Where interpretation is needed as to the exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions), the floodplain administrator shall make the necessary interpretation.

(6) Notify, in riverine situations, adjacent communities and the state coordinating agency, which is the State Department of Transportation and Development, prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Emergency Management Agency.

(7) Assure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained.

(8) When base flood elevation data has not been provided in accordance with section 8:832, the floodplain administrator shall obtain, review and reasonably utilize any base flood elevation data and floodway data available from a federal, state or other source, in order to administer the provisions of part V of this chapter.

(9) When a regulatory floodway has not been designated, the floodplain administrator must require that no new construction, substantial improvements or other development (including fill) shall be permitted within Zones A1-30 and AE on the community's FIRM, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one (1) foot at any point within the community.

(10) Under the provisions of 44 CFR Chapter 1 Section 65.12 of the National Flood Insurance Program Regulations, a community may approve certain development in Zones A1-A30, AE, AH, on the community's FIRM which increases the water surface elevation of the base flood by more than one foot, provided that the

community first applies for a conditional FIRM revision through FEMA.

Sec. 8:843. Permit procedures.

(1) Application for a development permit shall be presented to the floodplain administrator on forms furnished by him/her and may include, but not be limited to, plans in duplicate drawn to scale showing the location, dimensions and elevation of proposed landscape alterations, existing and proposed structures, and the location of the foregoing in relation to areas of special flood hazard. Additionally, the following information is required:

(a) Elevation (in relation to mean sea level), of the lowest floor (including basement) of all new and substantially improved structures;

(b) Elevation (in relation to mean sea level) to which any nonresidential structure shall be floodproofed;

(c) A certificate from a registered professional engineer or architect that the nonresidential floodproofed structure shall meet the floodproofing criteria of section 8:852(2);

(d) Description of the extent to which any watercourse or natural drainage will be altered or relocated as a result of proposed development;

(e) Maintain a record of all such information in accordance with section 8:842(1).

(2) Approval or denial of a development permit by the floodplain administrator shall be based on all of the provisions of this chapter and the following relevant factors:

(a) The danger to life and property due to flooding or erosion damage;

(b) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;

(c) The danger that materials may be swept onto other lands to the injury of others;

(d) The compatibility of the proposed use with existing and anticipated development;

(e) The safety of access to the property in times of flood for ordinary and emergency vehicles;

(f) The costs of providing governmental services during and after flood conditions, including maintenance and repair of streets and bridges, and public utilities and facilities such as sewer, gas, electrical and water systems;

(g) The expected heights, velocity, duration, rate of rise and sediment transport of the floodwaters and the effects of wave action, if applicable, expected at the site;

(h) The necessity to the facility of a waterfront location, where applicable;

(i) The availability of alternative locations, not subject to flooding or erosion damage, for the proposed use;

(j) The relationship of the proposed use to the comprehensive plan for that area.

Sec. 8:844. Variance procedures.

(1) The appeal board as established by the community shall hear and render judgment on requests for variances from the requirements of this chapter.

(2) The appeal board shall hear and render judgment on an appeal only when it is alleged there is an error in any requirement, decision or determination made by the floodplain administrator in the enforcement or administration of this chapter.

(3) Any person or persons aggrieved by the decision of the appeal board may appeal such decision in the courts of competent jurisdiction.

(4) The floodplain administrator shall maintain a record of all actions involving an appeal and shall report variances to the Federal Emergency Management Agency upon request.

(5) Variances may be issued for the reconstruction, rehabilitation or restoration of structures listed on the National Register of Historic Places or the state inventory of historic places, without regard to the procedures set forth in the remainder of this chapter.

(6) Variances may be issued for new construction and substantial improvements to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing the relevant factors in section 8:843(2) have been fully considered. As the lot size increases beyond one-half acre, the technical justification required for issuing the variance increases.

(7) Upon consideration of the factors noted above and the intent of this chapter, the appeal board may attach such conditions to the granting of variances as it deems necessary to further the purpose and objectives of this chapter (section 8:802).

(8) Variances shall not be issued within any designated floodway if any increase in flood levels during the base flood discharge would result.

(9) Variances may be issued for the repair or rehabilitation of historic structures upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure.

(10) Prerequisites for granting variances:

(a) Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.

(b) Variances shall only be issued upon (i) showing a good and sufficient cause; (ii) a determination that failure to grant the variance would result in exceptional hardship to the applicant, and (iii) a determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, or extraordinary public expense; create nuisances; cause fraud on or victimization of the public; or conflict with existing local laws or ordinances.

(c) Any application to whom a variance is granted shall be given written notice that the structure will be permitted to be built with the lowest floor elevation below the base flood elevation, and that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced lowest floor elevation.

(11) Variances may be issued by a community for new construction and substantial improvements and for other development necessary for the conduct of a functionally dependent use provided that (i) the criteria outlined in subsections (1)-(9) of this section are met, and (ii) the structure or other development is protected by methods that minimize flood damages during the base flood and create no additional threats to public safety.

PART V. PROVISIONS FOR FLOOD HAZARD REDUCTION

Sec. 8:851. General Standards.

In all areas of special flood hazard, the following provisions are required for all new construction and substantial improvements;

(1) All new construction or substantial improvements shall be designed (or modified) and adequately anchored to prevent flotation, collapse or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy;

(2) All new construction or substantial improvements shall be constructed by methods and practices that minimize flood damage;

(3) All new construction or substantial improvements shall be constructed with materials resistant to flood damage;

(4) All new construction or substantial improvements shall be constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding;

(5) All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the system;

(6) New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the system and discharge from the systems into floodwaters; and

(7) On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

Sec. 8:852. Specific standards.

Except as provided in subsection (6) of this section, in all areas of special flood hazard and in Zones B, C and X where base flood elevation data has been provided as set forth in section 8:832, section 8:842(8) or section 8:853(3), the following provisions are required:

(1) Residential Construction. New construction and substantial improvement of any residential structure shall have the lowest floor (including basement) elevated to meet the requirements of subsection (5) of this section. A registered professional engineer, architect or land surveyor shall submit a certification to the Floodplain Administrator that the standard of this subsection as proposed in section 8:843(1)(a) is satisfied.

(2) Nonresidential Construction. New construction and substantial improvements of any commercial, industrial or other nonresidential structure shall either have the lowest floor (including basement) elevated to meet the requirements of subsection (5) of this section or, together with attendant utility and sanitary facilities, be designed so that below the level required in subsection (5) the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. A registered professional engineer or architect shall develop and/or review structural

design, specifications and plans for the construction and shall certify that the design and methods of construction are in accordance with accepted standards of practice as outlined in this subsection. A record of such certification which includes the specific elevation (in relation to mean sea level or NGVD) to which such structures are floodproofed shall be maintained by the Floodplain Administrator.

(3) Enclosures. Solid fences, walls and landscaping features constructed or placed within the drainage system, as shown on the final plat, and new construction and substantial improvements, with fully enclosed areas below the lowest floor that are usable solely for parking of vehicles, building access or storage in an area other than a basement and which are subject to flooding, shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or meet or exceed the following minimum criteria:

(a) A minimum of two (2) openings having a total net area of not less than one (1) square inch for every square foot of enclosed area subject to flooding shall be provided.

(b) The bottom of all openings shall be no higher than one (1) foot above grade.

(c) Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

(d) Any variance of the requirements of this subsection must be approved by the Director of the Department of Public Works.

(4) Manufactured Homes.

(a) Require that all manufactured homes to be placed within Zone A shall be installed using methods and practices which minimize flood damage. For the purpose of this requirement, manufactured homes must be elevated and anchored to resist flotation, collapse or lateral movement. Methods of anchoring may include, but are not limited to, use of over the top or frame ties to ground anchors. This requirement is in addition to applicable state and local anchoring requirements for resisting wind forces.

(b) Require that manufactured homes that are placed or substantially improved within Zones A1-30, AH, and AE on the community's FIRM on sites (i) outside of a manufactured home park or subdivision, (ii) in a new manufactured home park or subdivision, (iii) in an expansion to an existing manufactured home

park or subdivision, or (iv) in an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial damage" as a result of a flood, be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated to be in compliance with subsection (1) of this section, and be securely anchored to an adequately anchored foundation system to resist flotation, collapse, and lateral movement.

(c) Require that all manufactured homes to be placed or substantially improved within Zones B, C, X, A1-30, AE and AE on the community's FIRM be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated to meet the requirements of subsection (5), and be securely anchored to an adequately anchored foundation system in accordance with the provision of this subsection (4)(a).

(d)1.a. All mobile home park owners with parks constructed prior to August 1, 1990, must submit a completed official certificate of elevation to the inspection division by November 15, 1990. As a prerequisite, the applicant must submit a ten dollar ($10.00) fee to the department of public works inspection division for the flood zone determination to be used in preparation of the certificate of elevation.

b. In lieu of individual certificates of elevation for each manufactured home space, the mobile home park owner may submit one (1) common certificate of elevation for the mobile home park site. The final plat shall comply with section 7:15 of this Code of Ordinances and shall also show the elevation of each manufactured home pad and the required lowest floor elevation pursuant to subsection (5) of this section.

c. All owners of manufactured homes subject to this provision shall comply with the freeboard requirements of subsection (5) by February 15, 1991. A temporary certificate of occupancy may be issued to the manufactured home owner pursuant to section A 103.9.3 of the Standard Building Code. This certificate shall expire on February 15, 1991, and shall not be renewed unless the manufactured home owner has complied with all freeboard requirements of subsection (5).

2.a. All owners of manufactured home subdivision lots and owners of an individually and privately owned manufactured home site developed prior to August 1, 1990, must submit a completed official certificate of elevation to the inspection division by November 15, 1990.

As a prerequisite, the applicant must submit a ten dollar ($10.00) fee to the department of public works inspection division for the flood zone determination to be used in preparation of the certificate of elevation.

b. All owners of manufactured homes subject to this provision shall comply with the freeboard requirements of subsection (5) of this section by February 15, 1991. A temporary certificate of occupancy may be issued to the manufactured home owner pursuant to a section A 103.9.3 of the Standard Building Code. This certificate shall expire on February 15, 1991, and shall not be renewed unless the manufactured home owner has complied with all freeboard requirements of subsection (5).

3. All mobile home park owners submitting construction documents for a mobile home park after August 1, 1990, shall, prior to approval by the inspection division, submit a common certificate of elevation for the mobile home park in toto and a final plat of the mobile home park site. The final plat shall comply with section 7:15 of this Code of Ordinances and shall also show the elevation of each manufactured home pad and the required lowest floor elevation pursuant to subsection (5) of this section. As a prerequisite, the applicant must submit a ten dollar ($10.00) fee to the department of public works inspection division for the flood zone determination to be used in preparation of the certificate of elevation.

4. All owners of a manufactured home subdivision lot and owners of an individually and privately owned manufactured home site developed after August 1, 1990, must submit, prior to approval by the inspection division, a completed official certificate of elevation pursuant to subsection (5) of this section. As a prerequisite, the applicant must submit a ten dollar ($10.00) fee to the department of public works inspection division for the flood zone determination to be used in preparation of the certificate of elevation.

5. Recreational vehicles require that recreational vehicles placed on sites within Zones A1-30, AH, and AE on the community's FIRM either (i) be on the site for fewer than 180 consecutive days, (ii) be fully licensed and ready for highway use, or (iii) meet the permit requirements of Section 8:843(1) and the

elevation and anchoring requirements for "manufactured homes" of this sub section. A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions.

(5) Minimum Slab Elevation. All new residential, nonresidential, manufactured homes and substantial improvements shall meet the following requirements:

(a) For those located in the special flood hazard area (Zone A, AE, and A1-A30) the minimum lowest floor elevation shall meet or exceed each of the following levels: two (2) feet above the FIRM base flood elevation, two (2) feet above the record inundation, and (1) foot above the center line of the street and one (1) foot above the top of the nearest upstream or downstream sanitary sewer manhole.

(b) For those located in Zones B and X, the minimum lowest floor elevation shall meet or exceed each of the following levels: one (1) foot above the nearest adjacent FIRM Base Flood Elevation, one (1) foot above the record inundation, one (1) foot above the center line of the street and one (1) foot above the top of the nearest upstream or downstream sanitary sewer manhole.

(c) For those located in Zones C and X the minimum lowest floor elevation shall meet or exceed each of the following levels: one (1) foot above the nearest adjacent FIRM base flood elevation, one (1) foot above the record inundation, one (1) foot above the center line of the street and one (1) foot above the top of the nearest upstream or downstream sanitary sewer manhole.

(d) The requirements set forth in subsections 5(a), (b), and (c) requiring that the minimum slab elevation be one (1) foot above the center line of the street shall not apply when the approved drainage schematic contemplates that: (1) the street pavement will not serve as the drainage collector system; or (2) drainage will not be conveyed toward the street.

(e) In lieu of the requirements regarding sanitary sewer manholes set forth in subsections (a), (b) and (c), the lowest floor elevation may be lower than one (1) foot but not lower than six (6) inches above the top of the nearest upstream or downstream sanitary sewer manhole, providing that the following requirements are met:

1. A sanitary sewer backwater check valve and a sewer cleanout:

a. Shall be installed in the building sanitary sewer line and located on the applicant's property but outside of the street rights-of-way and utility servitudes; and
b. Shall meet the requirements of section 8:110 of the plumbing code.

2. The property owner shall be responsible for perpetually maintaining the sanitary sewer backwater check valve in proper operating condition.

3. The property owner shall sign a notice of variance which shall serve to place on notice all future owners and shall make public record of such variance and the property owners' assumption of all liability pursuant to the granting of a waiver for the requirements regarding sanitary sewer manholes set forth in subsections (a), (b) and (c). This agreement shall be recorded by the clerk of court in the conveyance records; and a certified copy, with recording data and filing date, shall be furnished to the inspection division before a building permit will be issued.

(f) The lowest floor elevation may be lower than six (6) inches above the top of the nearest upstream or downstream sanitary sewer manhole provided that the provisions of subsection (e)(1), (2) and (3) are met and approval is granted by the chief engineer and the floodplain administrator.

(6) Use of Landfill Material Restricted.

(a) Except as provided hereinafter, in areas of special flood hazard (Zones A, A1-A30, AH and AE,) no off-site landfill material shall be allowed except for backfill required by chainwall construction. This subsection shall not apply to improvements and reasonable transition grading on existing tracts or lots of five (5) acres or less located within existing recognized subdivisions (residential, commercial, industrial and mobile home park) which have not experienced any reported inundation of structures constructed after July 2, 1979.

(b) Unless otherwise provided, no fill shall be permitted in areas of special flood hazard unless the fill is mitigated by excavation and meets the following requirements:
1. Fill shall not be used to restrict the existing channel cross-sectional area.
2. For channels with intermittent flow, the excavation site shall drain to the existing adjacent channel.

3. For channels with continuous flow, the excavation sites shall drain to the existing channel.
4. No credit shall be given, for mitigation purposes, for that portion of the excavation which is lower than the existing channel.

(c) No encroachments, including fill for landfill or other purposes, new construction, substantial improvements or other type of developments, may be placed unless a technical evaluation demonstrates that the proposed encroachments will not decrease the existing volume storage capacity, as calculated by the United States Army Corps of Engineers, within the boundaries of the proposed development or encroachment site located within the area of special flood hazard. Additionally, encroachment shall not increase the existing calculated base flood elevation.

(d) A technical evaluation shall include any one or a combination of the following methods:
1. For developments with proposed onsite fill and excavation construction (no imported or offsite fill), a before and after development construction grading plan shall be provided to show no decrease in the existing flood volume storage capacity, as calculated by the United States Army Corps of Engineers.
2. For developments requiring imported or off-site fill, approved engineering methodologies such as the methods shown in the Louisiana Department of Transportation and Development Hydraulics Manual shall be used to make a before and after development analysis of the proposed site, including its off-site drainage areas, to show the increased runoff for a 100-year storm event. The existing 100-year storm channel flow, the calculated base flood elevation and the hydraulic grade line for the channel at the downstream end of the proposed site will be provided by the engineering division of the department of public works. One or more of the following methods may be used, unless otherwise approved by the engineering division:
   i. A rating curve analysis shall be made of the channel to show that the water surface for a 100-year storm event resulting from the proposed development or landfill does not increase the calculated base flood elevation.
   ii. If the imported or off-site fill is taken from the channel (within the proximity of or within one-half mile upstream of the proposed development or landfill site), an inflow-outflow flood routing analysis of the

proposed borrow site on the channel shall be made to show that the adverse effect of increased runoff from the 100-year storm event due to the proposed development or landfill site is balanced by the beneficial effects of the increased storage provided by the proposed borrow site.

iii. If the imported or off-site fill is taken from elsewhere, approved engineering methodologies shall be used to show that the water surface elevation resulting from the proposed development or landfill does not increase the base flood elevation.

3. If downstream channel improvements are included as part of the proposed development or landfill, engineering calculations shall be made to show that the adverse effects of increased runoff from a 100-year storm event due to the proposed development is offset by the beneficial effects of the proposed channel improvements.

(7) Any permissible use of off-site landfill material, as provided in 8:852(6) shall be subject to the provisions of 8:6, section 106.2(d).

(8) No building shall be constructed over an existing identified natural drain as determined by the department of public works.

(9) The surface of parking lots, and private streets in subdivisions of more than five (5) lots, shall not be constructed lower than two (2) feet below the FIRM base flood elevation or record inundation, whichever is greater.

(10) When subsurface stormwater systems are available and designed to accommodate the flow of stormwater runoff:

(a) Except in single-family residential use, all paved parking areas shall be graded and sloped so that the stormwater runoff is conducted to trench drains or catch basins which are connected to the stormwater system.

(b) No sheet flow from paved parking areas on lots greater than one-third acre, but less than five (5) acres, shall be allowed to drain directly into the street-or street catch basins.

(c) Sheet flow from paved parking areas on lots greater than five (5) acres, in addition to the foregoing requirements, must be directed into a storm drain and catch basin system designed for this area which would be connected to the existing stormwater system or, if the aforesaid system is inadequate,

must be designed to include on-site detention/retention storage for stormwater runoff. The design of stormwater facilities must be submitted to the department of public works for approval.

The department of public works shall grant a waiver of the provisions of this subsection when it is demonstrated that the applicable existing streets have been designed to accommodate the stormwater runoff from paved parking areas and adequate catch basins and inlets are available.

Sec. 8:853. Standards for subdivision proposals.

(1) All subdivision proposals, including manufactured home parks and subdivisions, shall be consistent with Part I, sections 8:801 through 8:803.

(2) All proposals for the development of subdivisions, including manufactured home parks and subdivisions, shall meet development permit requirements of section 8:833, section 8:843, and the provisions of Part V of this ordinance.

(3) Base flood elevation data shall be generated for subdivision proposals and other proposed development, including manufactured home parks and subdivisions, which is greater than fifty (50) lots or five (5) acres, whichever is lesser, if not otherwise provided pursuant to section 8:832 or section 8:842(8).

(4) All subdivision proposals, including manufactured home parks and subdivisions, shall have adequate drainage provided to reduce exposure to flood hazards.

(5) All subdivision proposals, including manufactured home parks and subdivisions, shall have public utilities and facilities such as sewer, gas, electrical and water systems located and, constructed to minimize or eliminate flood damage.

Sec. 8:854. Standards for areas of shallow flooding (AO/AE Zones).

Located within the areas of special flood hazard established in section 8:832 are areas designated as shallow flooding. These areas have special flood hazards associated with base flood depths of one (1) to three (3) feet where a clearly defined channel does not exist and where the path of flooding is unpredictable and where velocity flow may be evident. Such flooding is characterized by-ponding or sheet flow; therefore, the following provisions apply;

(1) All new construction and substantial improvements of residential structures have the lowest floor (including basement) elevated above the highest adjacent grade at least as high as the depth number specified in feet on the community's FIRM (at least two (2) feet if no depth number is specified).

(2) All new construction and substantial improvements of nonresidential structures;

(i) Have the lowest floor (including basement) elevated above the highest adjacent grade at least as high as the depth number specified in feet on the community's FIRM (at least two (2) feet if no depth number is specified); or

(ii) Together with attendant utility and sanitary facilities, be designed so that below the base flood level the structure is water tight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads of effects of buoyancy.

(3) A registered professional engineer or architect shall submit a certification to the Floodplain Administrator that the standards of this section, as proposed in section 8:843(1)(a), are satisfied.

(4) Require within Zones AE or AO adequate drainage paths around structures on slopes, to guide floodwaters around and away from proposed structures.

Sec: 8:855. Floodways.

Floodways located within areas of special flood hazard established in Part III, Section 8:832, are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of flood waters which carry debris, potential projectiles and erosion potential, the following provisions shall apply:

(1) Encroachments are prohibited, including fill, new construction, substantial improvements and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge.

(2) If Part V, Section 8:855(1) above is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazard reduction provisions of Part V.

(3) Under the provisions of 44 CFR Chapter 1, Section 65.12, of the National Flood Insurance Regulations, a community may permit encroachments within the adopted regulatory floodway that would result in an increase in base flood elevations, provided that the

community first applies for a conditional FIRM and floodway revision through FEMA."

Section 2. The effective date of this ordinance shall be May 17, 1993.

Section 3. All ordinances or parts of ordinances in conflict herewith are hereby repealed.

CERTIFICATION

It is hereby found and declared by the City of Baton Rouge and Parish of East Baton Rouge that severe flooding has occurred in the past within its jurisdiction and will certainly occur within the future; that flooding is likely to result in infliction of serious personal injury or death, and is likely to result in substantial injury or destruction of property within its jurisdiction; in order to effectively comply with minimum standards for coverage under the National Flood Insurance Program; and in order to effectively remedy the situation described herein, it is necessary that this ordinance become effective immediately.

Therefore, an emergency is hereby declared to exist, and this ordinance being necessary for the immediate preservation of the public peace, health and safety, shall be in full force and effect from and after its passage and approval.

APPROVED: Lynda Imes
FOR: Tom Ed McHugh, Mayor-President
BY: Lynda Imes
Mayor-President Pro-Tem

PASSED: April 28, 1993
(date)

I, the undersigned, Council Administrator-Treasurer, do hereby certify that the above is a true and correct copy of an ordinance duly adopted by the Metropolitan Council, at a regular meeting duly convened on April 28, 1993.

Donald Ninda

Council Administrator-Treasurer

(SEAL)

SUBSECTION 3.02.04

METROPOLITAN COUNCIL

APR 8 1992

603 ORDINANCE 9420 Donald Mijoka

COUNCIL ADMINISTRATOR

AMENDING TITLE 8, CHAPTER 8 (FLOOD DAMAGE PREVENTION), PART V OF THE CODE OF ORDINANCES OF THE CITY OF BATON ROUGE AND PARISH OF EAST BATON ROUGE, SO AS TO ADD SECTION 855 THERETO TO ESTABLISH PENALTIES FOR VIOLATIONS IN THE FLOOD ZONE.

BE IT ORDAINED by the Metropolitan Council of the Parish of East Baton Rouge and City of Baton Rouge that:

Section 1. Title 8, Chapter 8, Part V of the Code of Ordinances of the City of Baton Rouge and Parish of East Baton Rouge, is hereby amended and re-enacted so as to add Section 855 thereto, which shall read as follows:

"Section 8:855. Compliance; Cease and Desist Notices; Civil Penalties.

(1) Upon a determination that a violation of this ordinance has occurred or is about to occur, the Director of the Department of Public Works shall notify the violator by certified mail that a violation has occurred or is about to occur. The notice shall set forth with reasonable specificity the following:

(a) The nature of the violation;

(b) A time limit for compliance;

(c) That in the event of noncompliance, a civil penalty may be assessed by a court of competent jurisdiction in a suit to be instituted by the City of Baton Rouge and Parish of East Baton Rouge.

(2) Civil Penalties.

(a) Any individual, including any agency, partnership, corporation, association or other entity, found to be in violation of this ordinance shall be liable for a civil penalty of not more than Five Hundred ($500.00) Dollars or the costs of restoring the land to its original condition prior to the time of the violation.

(b) In addition, any violator shall be subject to a civil penalty of One Hundred ($100.00) Dollars per day for each day a violation continues after notice is received that a violation has occurred and the violator fails to take corrective measures to remedy the violation. A violator who voluntarily corrects the violation cited within the time allotted by the Director of Public Works shall not be liable for this penalty.

(c) In the event that a violator refuses to correct a violation after due notice, the Director of Public Works is further authorized to enter upon the affected property and restore the land to its original condition prior to the time the violation occurred. The City of Baton Rouge or Parish of East Baton Rouge shall have a lien and privilege for the cost of correcting the violation against the lot and improvements whereon the violation occurred. In order to preserve the lien and privilege it shall be the duty of the Mayor-President to prepare and sign a sworn statement of facts, giving the description of the property and the approximate costs of correcting the violation, which statements of facts he shall cause to be filed and recorded in the mortgage office of the parish in which the property is located, and the City-Parish shall be entitled to recover the amount of this expense together with all costs of court, by ordinary process in the district court having jurisdiction of the property.

(3) The Office of the Parish Attorney is hereby authorized to institute a civil action in the name of the City of Baton Rouge or Parish of East Baton Rouge to recover any penalties resulting from a violation of this ordinance."

Section 2. All ordinances or parts of ordinances in conflict herewith are hereby repealed.

SUBSECTION 3.02.05

ADOPTED
METROPOLITAN COUNCIL

APR 8 1992

Donald Nijoka

COUNCIL ADMINISTRATOR

628 ORDINANCE 9418

AMENDING TITLE 12, CHAPTER 6, SECTION 401 (OBSTRUCTION OF DRAINAGE) OF THE CODE OF ORDINANCES OF THE CITY OF BATON ROUGE AND PARISH OF EAST BATON ROUGE, TO PROHIBIT PLACING DRAINAGE OBSTRUCTIONS IN CANALS AND ESTABLISHING PENALTIES.

BE IT ORDAINED by the Metropolitan Council of the Parish of East Baton Rouge and City of Baton Rouge that:

Section 1. Title 12, Chapter 6 of the Code of Ordinances of the City of Baton Rouge and Parish of East Baton Rouge, is hereby amended so as to amend and re-enact Section 401 thereof to read as follows:

"Sec. 12:401. Obstruction of Drainage.

No person shall impede or obstruct the passage flow of water of any gutter, ditch or drain, or in any manner dam the same, including sweeping or placing leaves, branches or other debris in the gutter, ditch or drain or within any servitude or right-of-way used for drainage purposes; nor shall a property owner or resident allow such material to remain in a gutter, ditch, drain, drainage servitude or right-of-way immediately adjacent to the property where they reside.

Any persons violating this section shall be fined one hundred dollars ($100.00) for each occurrence."

Section 2. All ordinances or parts of ordinances in conflict herewith are hereby repealed.

SUBSECTION 3.02.06

METROPOLITAN COUNCIL

JUN 12 1991

Donald Nijoka

COUNCIL ADMINISTRATOR

ORDINANCE 9287

AMENDING TITLE 8, CHAPTER 8 (FLOOD DAMAGE PREVENTION), PART III, SECTION 833 OF THE CODE OF ORDINANCES OF THE CITY OF BATON ROUGE AND PARISH OF EAST BATON ROUGE, IN ORDER TO PROVIDE FOR THE NECESSITY OF AN EROSION AND SEDIMENTATION CONTROL PLAN WITH THE SUBMISSION OF EACH DEVELOPMENT PERMIT.

BE IT ORDAINED by the Metropolitan Council of the Parish of East Baton Rouge and City of Baton Rouge that:

Section 1. Title 8, Chapter 8, Part III of the Code of Ordinances of the City of Baton Rouge and Parish of East Baton Rouge is hereby amended so as to amend and re-enact Section 833 thereof to read as follows:

"Section 8:833. Establishment of development permit.

A development permit shall be required to ensure conformance with the provisions of this chapter. Application for any development permit must include an erosion and sedimentation control plan designed to prevent sediment from leaving the site and to stabilize the ground both during and after construction to prevent or minimize erosion. Standards for erosion and sedimentation control plans shall be set forth by the development permit procedures."

Section 2. All ordinances or parts of ordinances in conflict herewith are hereby repealed.